BACHELOR THESIS & COLLOQUIUM – ME141502

THE USAGE OF AUTOMATIC IDENTIFICATION SYSTEM (AIS) FOR ESTIMATE FUEL OIL CONSUMPTION ON HARBOUR TUG

PANJI KRESNO WIJANARKO
NRP. 04211441000022

SUPERVISOR :
Ir. Hari Prastowo, M.Sc.
Dr.Eng. Trika Pitana, ST., M.Sc.

DOUBLE DEGREE PROGRAM
DEPARTMENT OF MARINE ENGINEERING
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SKRIPSI – ME141502

PENGGUNAAN AUTOMATIC IDENTIFICATION SYSTEM (AIS) UNTUK ESTIMASI KONSUMSI BAHAN BAKAR PADA KAPAL TUNDA

Panji Kresno Wijanarko
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Dosen Pembimbing :
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APPROVAL FORM

THE USAGE OF AUTOMATIC IDENTIFICATION SYSTEM (AIS) FOR ESIMATE FUEL OIL CONSUMPTION ON HARBOUR TUG

BACHELOR THESIS

Submitted to Comply One of the Requirements to Obtain a Bachelor Engineering Degree
on
Laboratory of Marine Operational and Maintenance (MOM)
Bachelor Program Departement of Marine Engineering
Faculty of Marine Technology
Sepuluh Nopember Institute of Technology

Prepared by
Panji Kresno W
NRP. 04211441000022

Approved by
Academic Supervisors

Ir. Hari Prastowo, M.Sc. ( )
NIP. 196510301991021001

Dr.Eng. Trika Pitana, ST., M.Sc. ( )
NIP. 197601292001121001

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Prepared by
Panji Kresno W
NRP. 04211441000022

Approved by
Head of Marine Engineering Departement

Dr.Eng. Muhammad Badrus Zaman, ST., MT.
NIP. 197708022008011007

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DECLARATION OF HONOR

I hereby who signed below declare that:

This final project has written and developed independently without any plagiarism act. All contents and ideas drawn directly from internal and external sources are indicated such as cited sources, literatures, and other professional sources.

Name	: Panji Kresno Wijanarko
Student Number	: 04211441000022
Final Project Title	: The Usage of Automatic Identification System (AIS) on Harbour Tug
Department	: Marine Engineering

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Surabaya, July 2018

Panji Kresno Wijanarko

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Name : Panji Kresno Wijanarko
Student Number : 04211441000022
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Supervisors : Ir. Hari Prastowo, M.Sc.
Dr.Eng. Trika Pitana, ST., M.Sc.

ABSTRACT

In the shipping business, fuel consumption become the largest cost item of a ship's operating expenses. PT. ABC is a company that provide pilotage , tug & assist service. Most of tugboat and pilotboat in PT. ABC still use traditional bunkering measurement such as tank sounding, even though there are many factors that contribute to errors in the calculation, such as the strike plate location, the dip tape, accuracy of tables, tank straps, trim , heeling and human error. Time and position from Automatic Identification System (AIS) are used to estimate fuel oil consumption. In addition, the survey is conducted by recording fuel rack position to estimate fuel injected to the engine at operation. This thesis purpose to estimate fuel oil consumption on harbour tug to help the decision making the shipping company. This thesis compare 5 condition such as fuel estimation using AIS as working hour, fuel estimation using working hour from daily report, fuel recorded from daily report, company estimation using AIS as working hour and company estimation using from daily report as working hour. As a results, for both of harbour tug (KT. Bima 333 and KT. Kresna 315) in one month analysis shows that fuel estimation using working hour from daily report are 67.412 litre and 76.707 litre, fuel recorded from daily report are 63.390 litre and 71.288 litre, company estimation using from daily report as working hour are 62.670 litre and 65.618 litre, fuel estimation using AIS as working hour are 56.806 litre and 65.900 litre and company estimation using AIS as working hour are 49.428 litre and 55.968 litre. The result shows similar pattern that fuel estimation using daily report working hours is the largest of all and followed by fuel recorded from daily report.

Keywords: AIS, Fuel, Estimation, Harbour Tug

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PENGGUNAAN AUTOMATIC IDENTIFICATION SYSTEM (AIS) UNTUK ESTIMASI KONSUMSI BAHAN BAKAR PADA KAPAL TUNDA

Nama : Panji Kresno Wijanarko
NRP : 04211441000022
Departmen : Marine Engineering
Dosen Pembimbing : Ir. Hari Prastowo, M.Sc.
Dr.Eng. Trika Pitana, ST., M.Sc.

ABSTRAK

Dalam bisnis pelayaran, konsumsi bahan bakar menjadi item biaya terbesar dari biaya operasional kapal. PT. ABC menyediakan layanan *pilotage, tug & assist* di pelabuhan namun sebagian besar kapal tunda dan *pilot boat* di PT. ABC masih menggunakan pengukuran bunkering tradisional seperti *sounding tank*, ada banyak faktor yang berkontribusi terhadap kesalahan dalam perhitungan, seperti posisi *strike plate, dip tape,* akurasi tabel sounding*, tank straps, trim , heeling* dan *human error*. Data posisi dan waktu pada Automatic Identification System (AIS) digunakan untuk estimasi bahan bakar selain itu, survei dilakukan dengan merekam posisi *fuel rack* untuk memperkirakan bahan bakar yang diinjeksikan ke mesin saat operasi. Tugas akhir ini bertujuan untuk memperkirakan konsumsi bahan bakar di kapal tunda untuk membantu pengambilan keputusan perusahaan. Dalam tugas akhir ini membandingkan 5 kondisi seperti estimasi bahan bakar menggunakan jam kerja dari AIS, estimasi bahan bakar menggunakan jam kerja dari laporan harian, bahan bakar tercatat dari laporan harian, estimasi perusahaan menggunakan jam kerja dari dan estimasi perusahaan menggunakan jam kerja dari laporan harian. Sebagai hasilnya, untuk kedua kapal tunda (KT. Bima 333 dan KT. Kresna 315) yang analisis selama satu bulan menunjukkan bahwa estimasi bahan bakar menggunakan jam kerja dari laporan harian adalah 67,412 liter dan 76,707 liter, bahan bakar yang tercatat dari laporan harian adalah 63,390 liter dan 71.288 liter, estimasi perusahaan menggunakan jam kerja dari laporan harian adalah 62.670 liter dan 65.618 liter, estimasi bahan bakar menggunakan jam kerja dari AIS adalah 56.806 liter dan 65.900 liter dan estimasi perusahaan menggunakan jam kerja dari AIS adalah 49.428 liter dan 55.968 liter. Hasilnya menunjukkan pola yang sama bahwa estimasi bahan bakar menggunakan jam kerja dari laporan harian adalah yang terbesar dari semua dan diikuti oleh bahan bakar yang tercatat dari laporan harian.

Kata kunci: AIS, Bahan bakar, Estimasi, Kapal Tunda

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PREFACE

Alhamdulillahirobbil 'alamin. All praise and glory to Almighty Allah (Subhanahu Wa Taalaa) who gave the courage and patience to accomplish this bachelor thesis. Peace and blessing of Allah be upon last Prophet Muhammad (Peace Be upon Him).

This bachelor thesis report entitled: "The Usage of Automatic Identification System (AIS) for Estimate Fuel Oil Consumption on Harbour Tug" in order to fulfill the requirements to obtaining the bachelor degree program at Marine Engineering Department, Faculty of Marine Technology, Institut Teknologi Sepuluh Nopember Surabaya.

The author realizes that carry out this thesis will be difficult without all supports and helps from various parties. Therefore, the author would like to give special thank to all people who has help the author for completing this bachelor thesis, among others:

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Surabaya, July 2018

Author

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CHAPTER 1
INTRODUCTION

1.1. Background

Tugboat become an important element to the ports globally for carrying out a variety of operations not only for pull and tow a vessel during maneuvering on port but also as a rescue boat. IMO GHG Study 2014 predicted shipping demand will increase until 2050 (Smith, et all. 2014), parallel with increase shipping demand, tugboats demand also expected to increase. Based on data of Ministry of Transportation, in Indonesia there are around 3.827 unit of tugboats in 2014. According to Marcon International as can be seen on table 1.1 about top 50 "sea-going" tug fleets by units, Indonesia occupy first position of the largest amount of tugboats by taking account 20% of total worldwide tug fleets.

Table 1.1 Top 50 "sea-going" tug fleets by units
(Marcon International, 2016)

No	Flag	Total BHP	%	#Tugs	%	Avg BHP	Avg Year
1	Indonesia	6,202,927	12.85%	3,596	20.07%	1,725	2007
2	Unknown	2,970,210	6.15%	1,760	9.82%	1,688	1991
3	USA	5,094,832	10.56%	1,489	8.31%	3,422	1982
4	Japan	2,538,396	5.26%	756	4.22%	3,358	2000
5	Singapore	2,093,376	4.34%	710	3.96%	2,948	2009
Worldwide		48,267,578	100.00%	17,917	100.00%	2,694	1,996

Fuel has an important role to support any maritime activities. In the shipping business, fuel on-board ship used to generate power of diesel engine to propel a ship to do some economic activities in order to achieve profit for the company, however fuel consumption take account more than 50% of voyage cost and become the largest cost item in term of ship's operating expenses (Stophford, 2009).

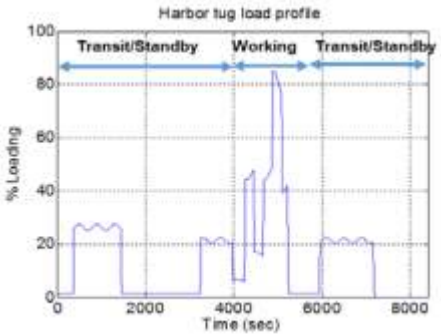


Figure 1.1 Harbour Tug Load Profile
(Source : Yuan, L.C.W. 2016)

The figure 1.1 shown the working region for the harbour less than 25 % of the total duration of operating time and the engine operate at low loading condition for stanby and transit, this condition is inefficient for engine operation because when engine loaded below 40%, Specific Fuel Oil Consumption increases exponentially (Yuan, 2016). Fuel consumption should be monitored and evaluated continuously in order to securing company revenue to reach the highest profit with lowest operating cost and better understanding about operational decision.

PT. ABC as subsidiary of PT. XYZ provided pilotage , tug & assist service at port managed by PT. XYZ . The total vessel owned by PT. ABC are 28 unit for tug boat and 30 unit for pilot boat. Most of tugboat and pilotboat in PT. ABC still used traditional bunkering measurement such as tank sounding, even though there are many factors that contribute to errors in the calculation, such as the strike plate location, the dip tape, accuracy of tables, tank straps, trim , heeling and human error (Faber,2013) and manual sounding may be very inaccurate at sea if the ship is moving (IMO, 2012). At the best condition the accuracy of manual sounding is around 5 % (Faber,2013), in addition PT. ABC also rarely evaluate fuel consumption in each ship, there is potentially occur error in fuel consumption report due to inaccurate measurement and human error.

All international voyaging vessels with above 300 Gross Tonnage and all passenger vessels are requires to be installed with an AIS transmitter. AIS messages include information regarding ship particular, voyage information and dynamic data. These signals can be captured by land based antenna (T-AIS) and satellites (S-AIS). Due to the mandatory reporting of AIS messages, it is

conceivable to investigate the attainability of following ship's terms of time and position of the ship to assessed fuel oil consumption.

1.2. Statement Problems

Based on the description of background above, there are four statements problems :

1. How application of Automatic identification System (AIS) can be used as supporting system to estimate fuel oil consumption ?
2. How to develop calculation of fuel oil consumption ?
3. How to compare this fuel oil calculation method to company method to estimate fuel oil consumption and the real data ?
4. How many factors that implied accuracy of this method ?

1.3. Research Limitation

There are research limitations in this thesis :

1. The harbour tug which is used in this reseach is recorded on Automatic Identification System (AIS) data and have a data support from classification society and shipping company.
2. The author will make an estimation or assumption to cover missing data.
3. This research is not evaluate emissions of the tugboat.
4. This research is calculate economical aspect.
5. This method only applied to investigated harbour tug (2 Unit)

1.4. Research Objectives

The objectives to be obtained in this thesis are :

1. To determine applicability of estimate fuel oil consumption based on Automatic identification System (AIS) data.
2. To develop estimating method to calculate fuel oil consumption
3. To compare the existing method by company to developed method
4. To determine the parameters that influence the accuracy to estimate fuel oil consumption using Automatic identification System (AIS) data.

1.5. Research Benefits

1. Understand the method to estimate fuel oil consumption based on Automatic Identification System (AIS) Data
2. Developed a recommendation to estimate fuel oil consumption in order to fuel cost saving of the company.

CHAPTER 2
LITERATURE REVIEW

2.1 Problem Overview

Fuel is a fraction obtained from petroleum distillation that used to generate power of diesel engine to propel a ship to do business to gain revenue for the company. However, fuel consumption take account more than 50% of voyage cost and become the largest cost item in term of ship's operating expenses as can be seen on figure 2.1 (Stophford, 2009) that make the fuel is a one of essential aspects to general cost of the ship.

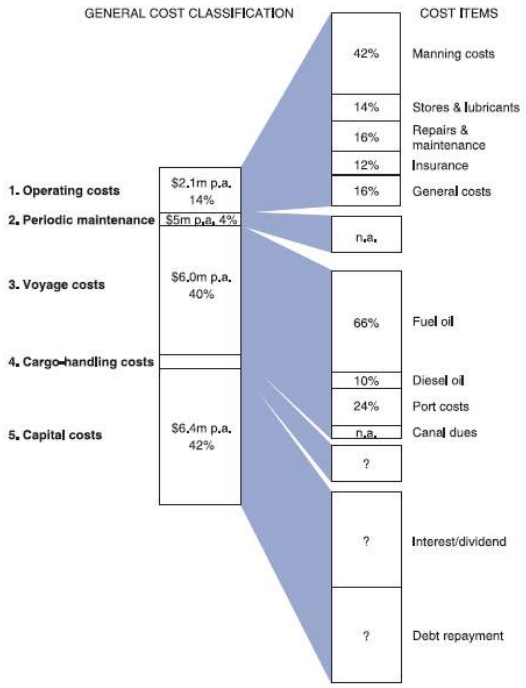


Figure 2.1 General Cost Classifiction
(Source: Stophford. 2009)

The survey conducted by Isabelle Rojon (Isabell, 2014) from 130 respondens consist of management company, shipowner and ship owner operator shows almost all respondents (92%) measure fuel consumption, the vast majority of them to be able to identify opportunities to improve energy efficiency and reduce costs. As a conclusion, fuel consumption measurement and performance analysis will be the important tools for ship owner or shipping company to maintain their

voyage costs and ensure the company's profitability. Other reasons for measuring fuel consumption are shown in Figure 2.2

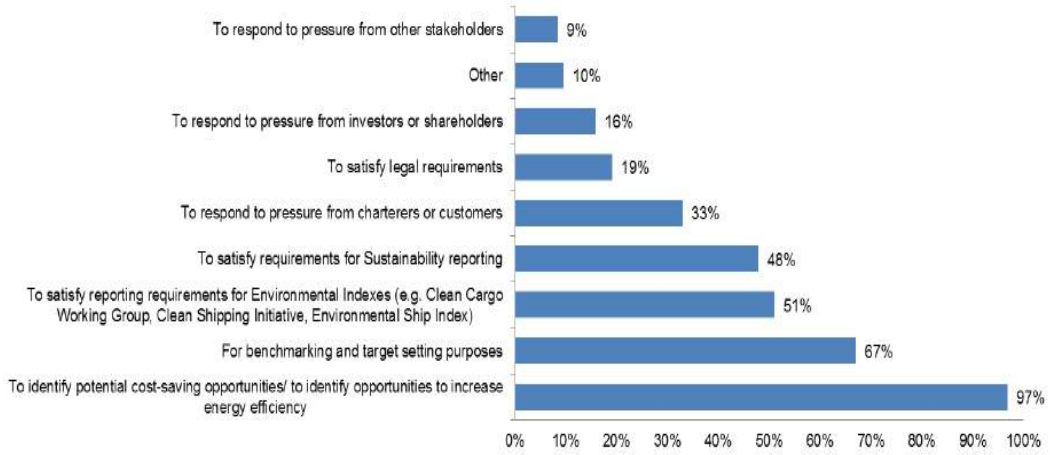


Figure 2.2 Reason for monitoring fuel consumption

(Source: R.Isabelle, 2014)

PT. ABC still rely on manual tank sounding for their fleets as method to measure fuel consumption on board, however there are factors that contribute to errors in the calculation, such as the strike plate location, the dip tape, accuracy of tables, tank straps, trim , heeling and human error (Faber, 2013) and when the ship is moving at sea, manual sounding can possibly be very inaccurate and another reason of inaccuracy might occur is because of the fact that the tank monitoring devices have to be regularly calibrated to make sure accuracy. At the best condition the accuracy of manual sounding is around 5 % (Faber, 2013).

As a result there are possibility of discrepancies between the tank volume measured and the actual volume consumed, this is may cause a bias to recording fuel consumption (IMarEST, 2012). In addition, PT. ABC, rarely evaluate fuel consumption in each ship, there is potentially occur an error on recording and estimating fuel oil consumption due to inaccurate measurement and human error.

2.2 Tug

The purpose of tug commonly divided into three :

2.2.1. Harbour Tug

Harbour tugs are used to push or pull ships in order to assist the ships during berthing and unberthing operations on port. When a large ship entering shallow waters there are many potential hazards, such as collision or grounding. Not only to tow , this type of tug used hull and fender for pushing a ship in the port.

Figure 2.3 Harbour Tug
(Source: R.Allan, 2013)

2.2.2. Escort Tug

To Prevent an oil accidents, the requirements to increase safety of tanker have been build, such as tug boats to provide to escort and assist a tanker in shallow waters, coastal and dangerous area. Escort tugs propulsion system generally can produce forces greater than the bollard pull delivered.

Figure 2.4 Escort Tug
(Source: R.Allan, 2013)

2.2.3. Sea-going Tug

The function of seagoing tugs are designed to tow or push in order to assist the ships in ports as well as at sea. Seagoing tugs can easily operate in any area such as deep sea towage, coastal towage or at a offshore terminal tugs.

Figure 2.5 Oceangoing Tug by Indian Navy
(Source: Balakhrisnan.P.K, 2016)

2.3 Fuel Consumption

Fuel oil is important aspect to generate power to propel a ship, fuel oil basically is a fraction obtained from petroleum distillation (distillate or a residue). Generally, fuel on board ship using four type of fuel oil for instance HFO, MDO, HSD and LNG. It used in different type of engine.

And there are several factors that make fuel consumption increase such as :

- Speed
- Resistance
- Increased draft and displacement
- Worsening of weather conditions
- Worsening of hull and propeller roughness

2.4 Hindcast Data

The hindcast approach entails running atmospheric and ocean response models for a historical period (typically several decades long) in order to develop the specification of climate and extremes for an application.

There are several data can be obtained :

- Tides Current
- Wind speed
- Wave height

2.5 Automatic Identification System (AIS)

Automatic Identification System (AIS) is a communication system that uses Very High Frequency (VHF) system or satellite system. AIS allows an exchange of information from the vessel using a device called AIS Receiver. AIS data commonly use as traffic management that allows exchange information between vessels that are in the same area, to avoid high risk situations (Smestad,2015).

2.5.1. AIS Data Content

The data content is given by the 'Guidelines for the onboard operational use of shipborne AIS' by IMO . In this thesis the following AIS data content is mainly used:

1. Maritime Mobile Service Identity (MMSI)
2. IMO number
3. Main dimensions - length and breadth of ship
4. AIS ship type
5. Position - latitude and longitude
6. Speed over ground - the ships speed relative to the ground as opposed to the water
7. Current ship draught
8. Ship name

2.6 Phase of Harbour Tug on Port

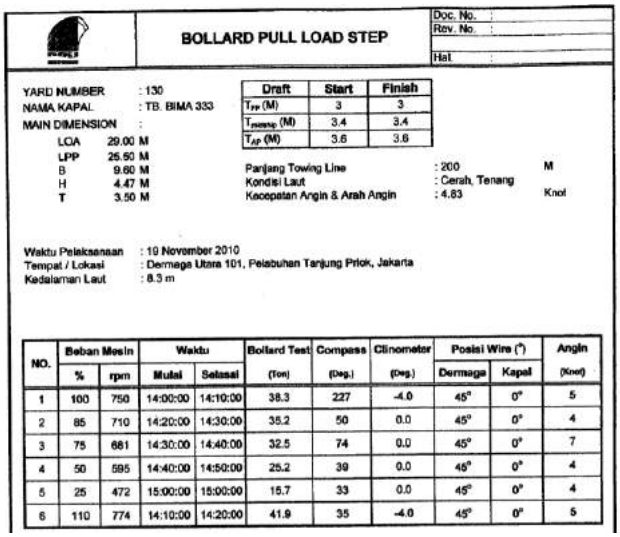
Based on literature tug use on port (Hensen,2003) in general , there are three phase on perform tugs assistance depending on the local situation:

1. The phase whereby a ship has reasonable speed
   When the ship approaching the port , the engine and rudder of the ship still in running condition to compensate for drift force cause by wind, current or wave , by steering a drift angle.

2. The intermediate phase
   When a ship has to reduce speed, entering a dock harbour basin, turning circe or approaching a berth. The ship also has to be stopped within a certain distance. When the ship reducing speed, ship steering performance is decrease and also propeller has to be stopped
3. The phase involving the final part of the arrival manoeuvre
   The ship is practically dead in the water such as in the turning circle and / or when berthing. This ship is very restricted in manoevring performance and not able to compensate for wind and current force. Tugs have to assist fully

2.7 Bollard Pull Test

Bollard pull is a parameter to measure of the towing or pulling power of a tugboat. It is defined as the force in tons or kilonewtons exerted by a vesselunder full power, on a shore-mounted bollard through a tow-line, commonly measured in a practical test under test conditions that include calm water, no tide, level trim, and sufficient depth and side clearance for a free propeller stream. In general , The bollard pull of a vessel reported as two numbers, the static maximum bollard pull (the highest force measured) and the steady or continuous bollard pull, the average of measurements over an interval of, for example, 10 minutes.



BOLLARD PULL LOAD STEP

Doc. No. :
Rev. No. :
Hal :

YARD NUMBER : 130
NAMA KAPAL : TB. BIMA 333
MAIN DIMENSION :
LOA 29.00 M
LPP 25.50 M
B 9.60 M
H 4.47 M
T 3.50 M

Draft	Start	Finish
T_{FP} (M)	3	3
$T_{midship}$ (M)	3.4	3.4
T_{AP} (M)	3.6	3.6

Panjang Towing Line : 200 M
Kondisi Laut : Cerah, Tenang
Kecepatan Angin & Arah Angin : 4.83 Knot

Waktu Pelaksanaan : 19 November 2010
Tempat / Lokasi : Dermaga Utara 101, Pelabuhan Tanjung Priok, Jakarta
Kedalaman Laut : 8.3 m

NO.	Beban Mesin		Waktu		Bollard Test	Compass	Clinometer	Posisi Wire (°)		Angin
	%	rpm	Mulai	Selesai	(Ton)	(Deg.)	(Deg.)	Dermaga	Kapal	(Knot)
1	100	750	14:00:00	14:10:00	38.3	227	-4.0	45°	0°	5
2	85	710	14:20:00	14:30:00	35.2	50	0.0	45°	0°	4
3	75	681	14:30:00	14:40:00	32.5	74	0.0	45°	0°	7
4	50	595	14:40:00	14:50:00	25.2	39	0.0	45°	0°	4
5	25	472	15:00:00	15:00:00	15.7	33	0.0	45°	0°	4
6	110	774	14:10:00	14:20:00	41.9	35	-4.0	45°	0°	5

Figure 2.6 Bollard Pull Test on Shipyard
(Source: PT. ABC)

2.8 Bollard Pull Required

This Method conducted to calculate the required total bollard pull of tugs for performing operations. Based on literature (Hensen. 2003) there are main factors that influence tugs assistance such as port particulars (restriction in fairway, port entrance, passage to aberth, turning circle, manoeuvring space at a berth or harbour basin, available stopping distance, locks, bridges, mooring vessels, water depths, speed restrictions), berth construction (open, jetty or solid), the ship (size, draft and underkeel clereance, trim, windage, engine power, etc) , environmental (wind, current, waves, visibility) and method of tug assistance (towing or operating at a ship side or combination).

According to Tug Use in Port (Hensen, 2003) also developed a method to estimate bollard pull required when the ship approaching port :

1. Wind Force
   The following formula to estimate bollard pull required for beam winds :

$$Fw = 0.08\, V^2 AL \text{ kgf} \qquad (2.1)$$

   Where,
   V : Wind velocity in m/sec
   A_L : Longitudinal wind area in m^2
   Besed on the formula above, presented on a diagram below :

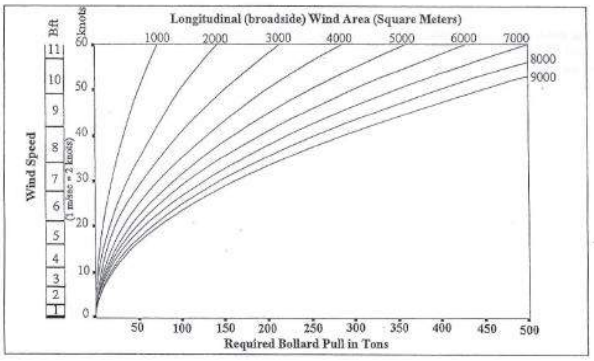


Figure. 2.7 Bollard pull required to compensate for beam winds
(Source: Hensen 2003)

2. Current Force

The current force acting on a ship can be calculated un the same way as wind force. This force strongly corelated with underkeel clereance

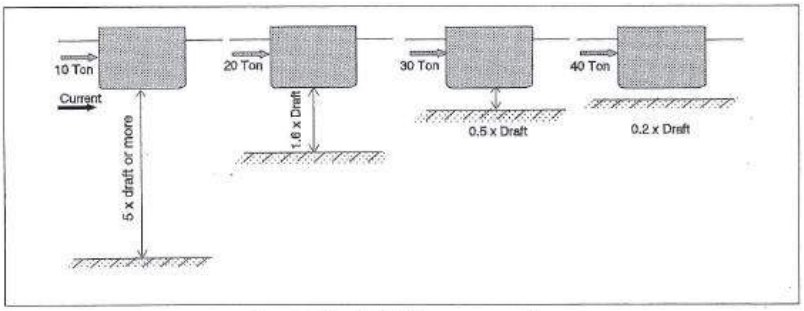


Figure 2.8 Corelation Underkeel clereance and current force

(Source : Hensen 2003)

Here the formula with different underkeel clereance creteria :

With underkeel clereance decreased to 1.5 x ship's draft bollard pull required roughly :

$$Fc = 110\ V^2 LBP\ T \text{ kgf} \qquad (2.2)$$

With underkeel clereance of 20% of ship's draftf, bollard pull required is approximately :

$$Fc = 150\ V^2 LBP\ T \text{ kgf} \qquad (2.3)$$

When underkeel clereance is further reduced to 10 % the bollard pull required is nearly five times as high as in deep water, approximately :

$$Fc = 185\ V^2 LBP\ T \text{ kgf} \qquad (2.4)$$

Where,

V : Current Velocity in m/sec

L_{bp} : Length between perpendiculars in m

T : Draft

Figure 17. give indicaton of bollard pull required for cross currents and is based on the affirmentioned formula and OCIMF coefficient for loaded tanker. The outcome include safety margin 20 %.

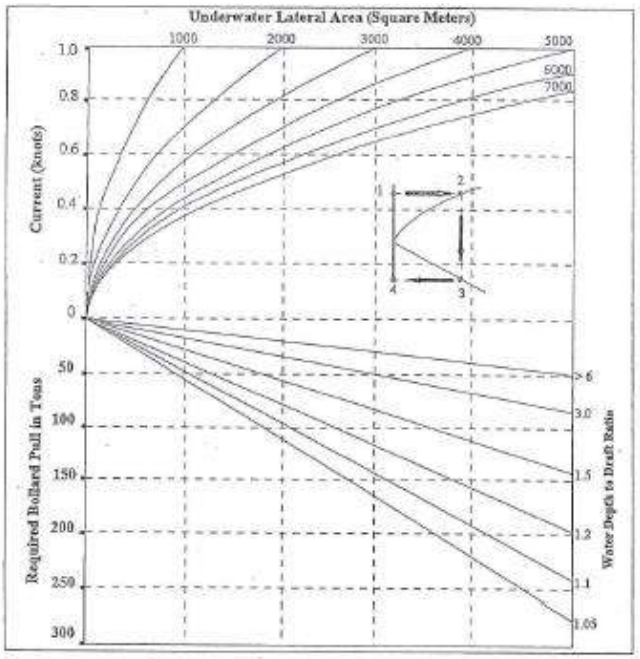


Figure 2.9 Bollard Pull Required in a cross current
(Source : Hensen 2003)

3. Wave Force

The simplified formula for rougly calculating the bollard pull required to hold a ship up against short period beam waves reads :

$$Fwave = 112\ L\ Hs^2 \text{ kgf} \qquad (2.5)$$

On the basis of this formula the bollard pull required is represented in the graph in figure 2.10.

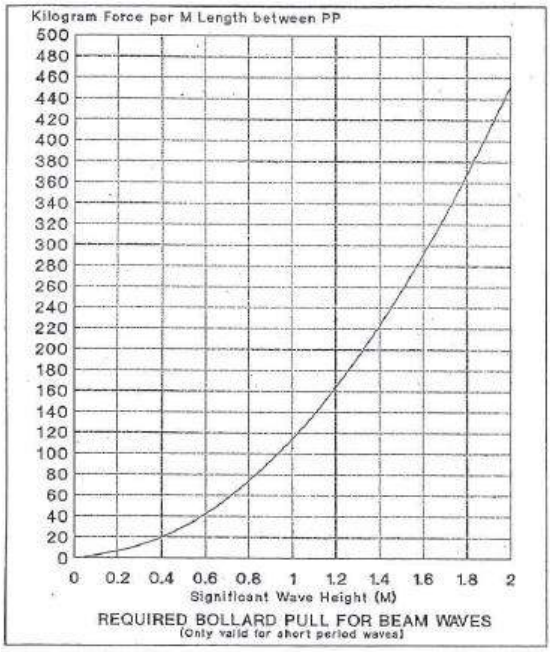


Figure 2.10 Bollard Pull Required for beam waves

(Source : Hensen 2003)

4. Total Required Bollard pull is sum from wind force + wave force + current force that affect the ship in towing sevice , but if there is ship with large displacement commonly tanker / bulk carrier the total bollard pull requirement is using this formula :

$$Required\ bollard\ pull = \left(\frac{Displacement}{100.000} \times 60\right) + 40 \qquad (2.6)$$

Also this method provide an approach method to measure bollard pull required as in figures 2.11 , 2.12 and 2.13.

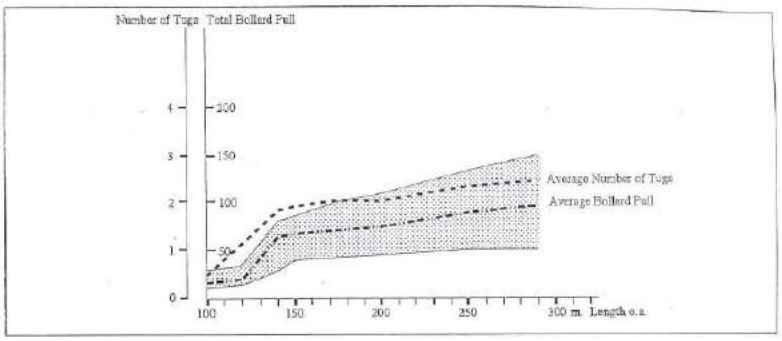


Figure 2.11 Bollard Pull in tons and average number of tug for container and general cargo vessel in a number of port around the world (based on length overall)

(Source : Hensen 2003)

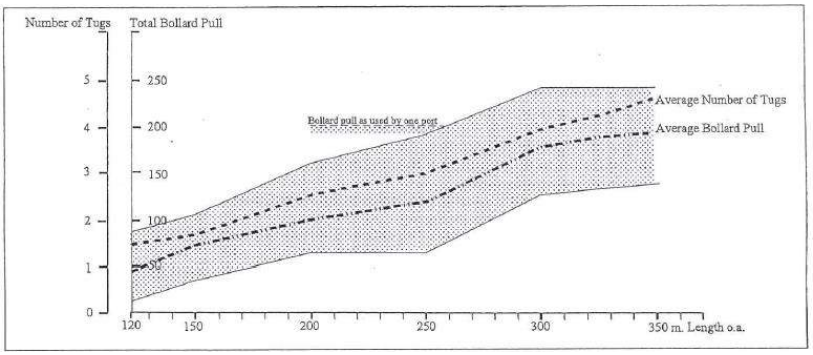


Figure 2.12 Bollard Pull in tons and average number of tug for tanker and bulk carriers in a number of port around the world (based on length overall)

(Source : Hensen 2003)

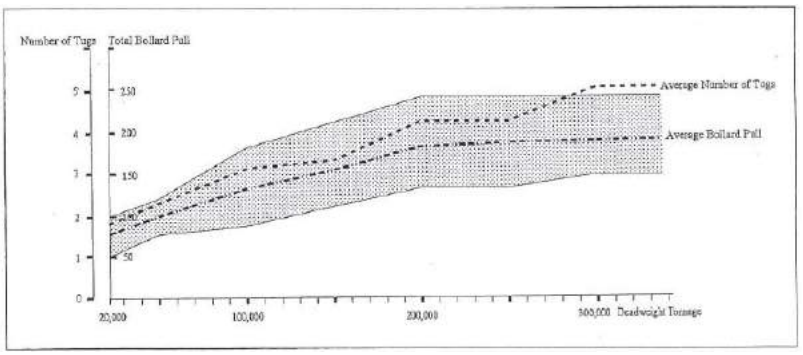


Figure 2.13 Bollard Pull in tons and average number of tug for tanker and bulk carriers in a number of port around the world (based on deadweight)

(Source : Hensen 2003)

2.9 Engine Testbed / Engine Shop Trial Test

Test bed data conducted to test machinery of the engine room such as boilers, auxiliary engines and the main engine in the manufacturing plant. The function of engine testbed is to obtain performance curves enables to run the ship safely and economically.

During the test bed or shop trial the performance curves of the engine are plotted. There are several parameters that to be measured in this test such as :

1. Engine RPM vs. Load: The function of this curve is used to verify the condition of main engine is overloaded or not. In case, a higher power generated at a lower RPM it means main engine is over loaded.

2. Mean effective pressure vs. Load: The function of this curve is used to measure horse power so these two values should co-relate.

3. Maximum pressure vs. Load: The function of this curve is used to know the compression condition in the cylinder, condition of fuel injection equipment, injection timing, etc.

4. Compression pressure vs. Load: The function of this curve is used to shown the condition of equipment that maintain compression process such as piston, piston rings and exhaust valves.

5. Scavenge air pressure vs. Load: This curve displayed the state of the turbocharger and related equipment.

6. Exhaust gas temperature in receiver vs. Load: This curve is used to shown the enthalpy of the exhaust gas before entry in turbocharger. This value also indicates turbocharger efficiency.

7. Exhaust gas temperature after exhaust valve vs. Load: The function of this curve is used to know the condition of combustion, fuel injection, timing and compression etc.

8. Exhaust gas temperature after turbocharger vs Load: This curve is used to measures the enthalpy from the exhaust by the turbocharger and indicate its condition.

9. Total excess air ratio vs Load: This curve is used to indicates the power raises the excess air decreases because consumption and show the condition of turbocharger

10. Specific fuel oil consumption vs. Load: The function of this curve is used to check the engine is consuming fuel oil correctly according the load condition.

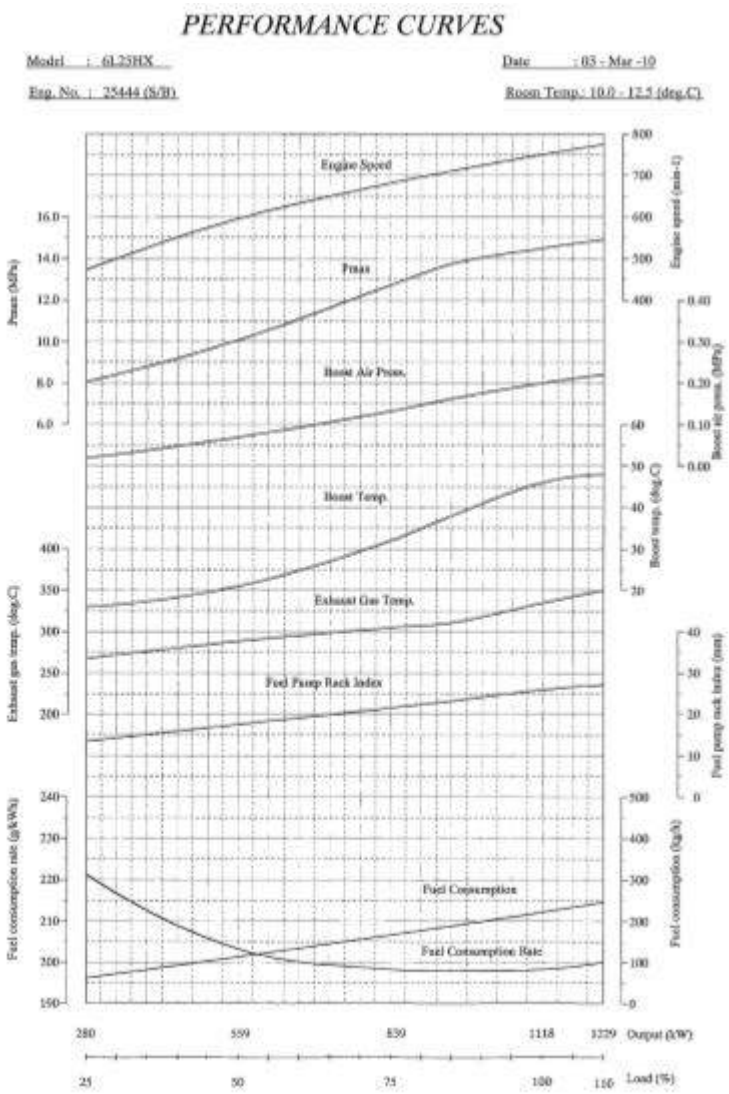


Figure 2.14 KT. BIMA 333 Engine Performance Curve

(Source: Niigata)

2.10 Tugboat Load Profile

Based on ABB Singapore Pte. Ltd, as can be seen on table 2.1, Typical load profile of harbour tugs during operation are 65% of overall operation cycle in low load with 10% rated power, 20 of overall operation cycle in medium load with 30% rated power and 15% of overall operation cycle in high load with 90% rated power. Figure 2.15 shows 5080 horse power tugboat load profile which is relatively same as describe above

Table 2.1 Typical Harbour Tug Operating Modes

(Source: Adnanes, 2012)

OPERATING MODES	At Quay	Loitering	Slow steam	Full Steam	Assist Low	Assist High
Duration (%)	20	20	25	10	10	15
Power Demand (%)	5	10	10	35	25	90

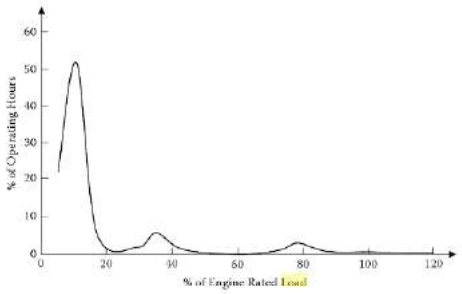


Figure 2.15 A 5080-hp tugboat load profile in Los Angeles and Long Beach harbours

(Source: Foss Maritime Company)

Due to the lack of information about engine load (Adnanes, 2012) making an approach to estimate in term of engine load and operating time depicted in figure 2.16.

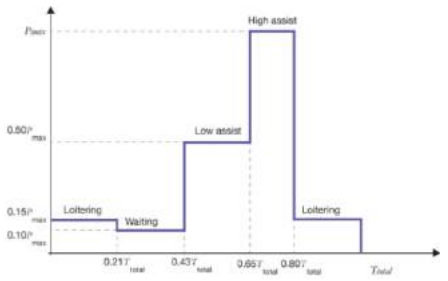


Figure 2.16 Tug load profle

(Source: Adnanes. 2012)

CHAPTER 3
METHODOLOGY

3.1 Flowchart Methodology

In this bachelor thesis , shows how the author developed a methodology to finish the research according flow chart below :

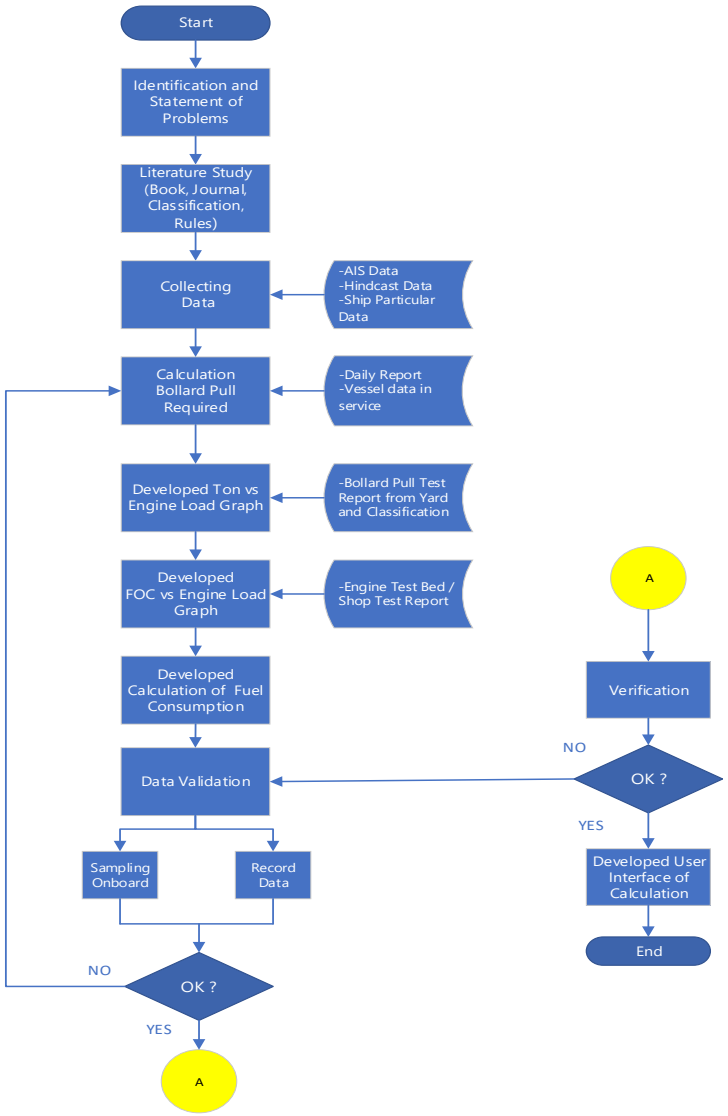


Figure 3.1 Flow Chart Methodology

3.2 Definition of Flowchart Methodology

3.2.1 Statement of Problems

This step is a first step to conduct the thesis. In this step, the existing problem is identify by question and collect information regarding existing problem. The thesis contents is come from the statement of the problems and also the main objective of this thesis can be found in this step.

3.2.2 Study of Literature

Study of literature is rise after understanding the statement problem. In this step,references and information that support the completion of thesis are found. Various literature topics is needed for deep understanding about the problem and its solution. To complete this step by reading national or international papers, journals, thesis, media and also literature books.

3.2.3 Collecting Data

Collecting data is gather information from the company to support data analysis , there are 3 main data; ship database from classification society and shipping service company such as ship particular,hindcast data (wave, current) and AIS data. AIS Data from AIS ITS and added hindacast data for better measurement. This step is important because absence one or several data will be impact of data analysis and effect the result of this thesis.

3.2.4 Calculating Bollard Pull Required

From this step, process of calculate and analysis based on deck officer report and vessel in service report from the company are conducted. The data connected to reference that to be done in previous step. In this step, the objective is to determine bollard pull required in each harbour tug service in the port.

3.2.5 Developed Ton vs Engine Load Graph

In this step, the result from bollard pull required compared with bollard pull test on each harbour tug to see the relation of bollard pull and engine load. In this step, the objective is to know engine load in various bollard pull in ton.

3.2.6 Developed FOC vs Engine Load Graph

After know the relation of engine load and bollard pull, this result plotted on FOC vs Engine load graph based on engine shop test / engine testbed in each harbour tug. In this step, the objective is to know engine FOC and RPM of engine to calculate fuel oil consumption on different load.

3.2.7 Developed Calculation of Fuel Oil Consumption

After validation complete, the objective is to developed calculation of fuel oil consumption with different input (load and environmental condition).

3.2.8 Data Validation

This step compare record data and sampling on board, the objective is to know the deviation of real data on board and estimate method conducted in this thesis.

3.2.9 Verification

This step to confirm again if there are errors when developed alghorithm to calculate fuel consumption

3.2.10 Developed User Interface of Calculation

This is the final step, user interface is developed to ensure that the user is easy to understand the parameters that should be input to this calculation.

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CHAPTER 4
DATA ANALYSIS

4.1. Data

There are several data has been collected from various source such as company, AIS data service, hindcast weather data service, etc.

4.1.1. Ship Particular

Ship particular is detail data as identity of the ship such as general data, machinery data and owner. Detail harbour tugs particular data is obtained from PT. ABC as an owner of harbour tug. In this thesis used harbour tug named KT. Bima 333 and KT. Kresna 315.

4.1.1.1.KT. BIMA 333

GENERAL

Vessel Name	: BIMA 333
Kind of Vessel	: Tug Boat/Steel
Owner	: PT. XYZ
Flag	: Indonesia
Call Sign	: YDA. 5154
IMO Number	: 9588225
GT	: 294
NT	: 89
Length Overall	: 29 m
Length Perpendicular	: - m
Breadth Moulded	: 9.6 m
Depth Moulded	: 4.77 m
Design Draft	: 3.5 m
Speed	: 12 knots
Classification	: BKI

MACHINERY

Main Engine	: Two (2) unit of 1500 HP, Marine Diesel Engine, Niigata 6 L 25 HX2P21 , 750 rpm
Auxiliary Engine	: Two (2) units of 223 HP, Cummins, 6 CTA 83 D (M)

4.1.1.2.KT. KRESNA 315

GENERAL

Vessel Name	: KRESNA 315
Kind of Vessel	: Tug Boat/Steel
Owner	: PT. ABC
Flag	: Indonesia
Call Sign	: YD 5242
IMO Number	: 9486128
GT	: 213
NT	: 64
Length Overall	: 30.81 m
Length Perpendicular	: 28.50 m
Breadth Moulded	: 9.40 m
Depth Moulded	: 4.15 m
Design Draft	: 3.10 m
Speed	: 13 knots
Classification	: Korean Register (KR)

MACHINERY

Main Engine	: Two (2) unit of 1323 KW, Marine Diesel Engine, Niigata 6L25HX ; 4-Cycle ; Single Acting, 750 rpm
Auxiliary Engine	: Two (2) units of 186 KW DOOSAN ; 1800 rpm

4.1.2. Engine Testbed Data

Engine are should be tested using water brake dynamometer to give information about engine performance information before send to the costumer by engine manufacturer. In this case both of harbour tugs are using Niigata as main engine. Shop test are measures engine performance parameter for example :

1. Engine Load
2. Engine Speed
3. Specific Fuel Oil Consumption
4. Fuel Oil Consumption
5. Pressure
6. Lubricating Oil and Cooling Water Temperature
7. Exhaust Gas Temperature
8. Fuel Rack

4.1.2.1. Fuel Oil Consumption and Specific Fuel Oil Consumption vs Engine Load

1. KT. BIMA 33

Starboard Engine

Table 4.1 SB Engine Load vs Power Developed

(Source: Niigata Engine Shop Test)

No	Load (%)	FOC (kg/h)	SFOC (g/kwh)
1	25	62.0	221.3
2	50	113.6	203.3
3	75	166.4	198.3
4	85	188.2	198.1
5	100	221.7	198.3
6	110	245.9	200.1

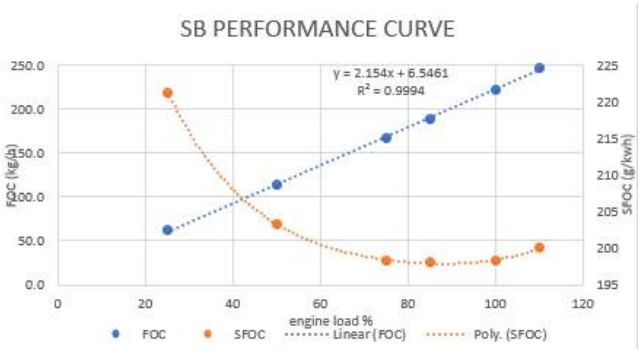


Figure 4.1 SB Engine Load vs Power Developed Diagram

From the figure 4.1 shown the relation between fuel oil consumption vs engine load are linear with the regression line (R^2) = 0.9994 and the formula is :

$$y = 2.154x + 6.5461 \qquad (4.1)$$

with x : engine load (%)
y : fuel oil consumption (kg/h)

and the relation between specific fuel oil consumption (sfoc) vs engine load are polynomial with the regression line (R^2) = 0.9999 and the formula is :

$$y = 1E\text{-}06x^4 - 0.0004x^3 + 0.0509x^2 - 3.0877x + 272.42 \qquad (4.2)$$

with x : engine load (%)
y : specific fuel oil consumption (g/kwh)

Portside Engine

Table 4.2 PS Engine Load vs Power Developed

(Source: Niigata Engine Shop Test)

No	Load (%)	FOC (kg/h)	SFOC (g/kwh)
1	25	61.9	221.1
2	50	113.3	203.7
3	75	166.3	198.2
4	85	188.1	198
5	100	221.8	198.4
6	110	245.3	199.6

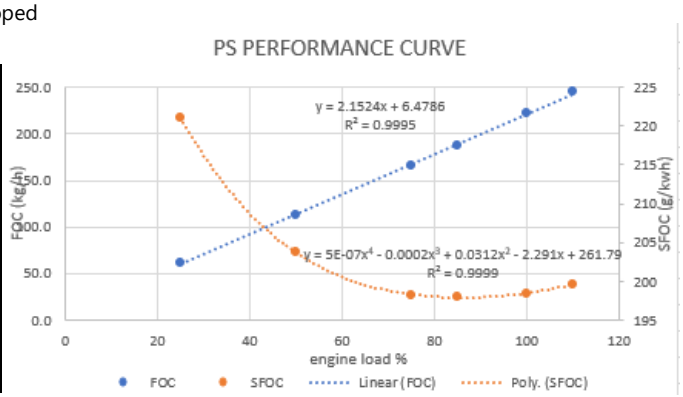


Figure 4.2 PS Engine Load vs Power Developed Diagram

From the figure 4.2 shown the relation between fuel oil consumption vs engine load are linear with the regression line (R^2) = 0.9995 and the formula is :

$$y = 2.1524x + 6.4786 \qquad (4.3)$$

with x : engine load (%)

y : fuel oil consumption (kg/h)

and the relation between specific fuel oil consumption (sfoc) vs engine load are polynomial with the regression line (R^2) = 0.9999 and the formula is :

$$y = 5E\text{-}07x^4 - 0.0002x^3 + 0.0312x^2 - 2.291x + 261.79 \qquad (4.4)$$

with x : engine load (%)

y : specific fuel oil consumption (g/kwh)

2. KT. KRESNA 315

Starboard Engine

Table 4.3 SB Engine Load vs Power Developed
(Source: Niigata Engine Shop Test)

No	Load (%)	FOC (kg/h)	SFOC (g/kwh)
1	25	71.9	217.3
2	50	136.7	206.6
3	75	199.4	201
4	100	266.6	201.5
5	110	294.8	202.6

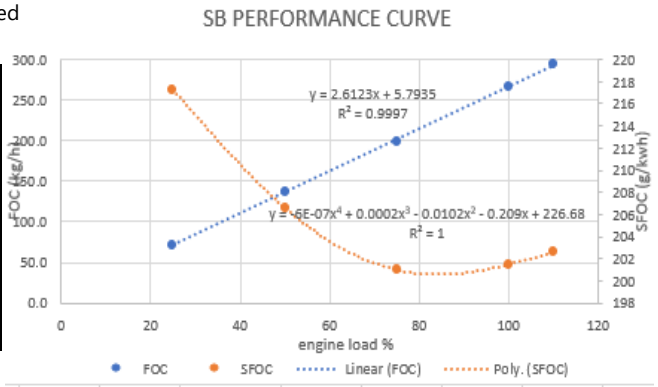


Figure 4.3 SB Engine Load vs Power Developed Diagram

From the figure 4.3 shown the relation between fuel oil consumption vs engine load are linear with the regression line (R^2) = 0.9994 and the formula is :

$$y = 2.6123x + 5.7935 \qquad (4.5)$$

with x : engine load (%)
y : fuel oil consumption (kg/h)

and the relation between specific fuel oil consumption (sfoc) vs engine load are polynomial with the regression line (R^2) = 0.9999 and the formula is :

$$y = -6E\text{-}07x^4 + 0.0002x^3 - 0.0102x^2 - 0.209x + 226.68 \qquad (4.6)$$

with x : engine load (%)
y : specific fuel oil consumption (g/kwh)

Portside Engine

Table 4.4 PS Engine Load vs Power Developed

(Source: Niigata Engine Shop Test)

No	Load (%)	FOC (kg/h)	SFOC (g/kwh)
1	25	72.5	219.1
2	50	136.2	205.9
3	75	199.4	201
4	100	266.1	201.1
5	110	294.4	202.3

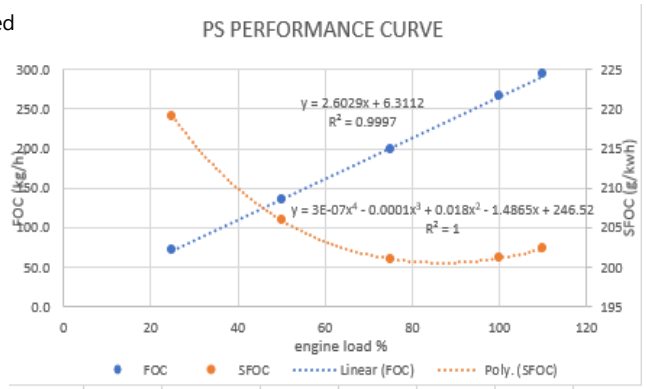


Figure 4.4 PS Engine Load vs Power Developed Diagram

From the figure 4.4 shown the relation between fuel oil consumption vs engine load are linear with the regression line (R^2) = 0.9994 and the formula is :

$$y = 2.6029x + 6.3112 \qquad (4.7)$$

with x : engine load (%)

y : fuel oil consumption (kg/h)

and the relation between specific fuel oil consumption (sfoc) vs engine load are polynomial with the regression line (R^2) = 0.9999 and the formula is :

$$y = 3E\text{-}07x^4 - 0.0001x^3 + 0.018x^2 - 1.4865x + 246.52 \qquad (4.8)$$

with x : engine load (%)

y : specific fuel oil consumption (g/kwh)

4.1.3. Generator Data Sheet

Fuel consumption rate on generator can be obtained from generator data sheet provided by maker (Cummins and Doosan).

1. KT BIMA 333

Auxiliary Engine : Two (2) units of 223 HP, Cummins, 6 CTA 83 D (M)

Table 4.5 FOC and SFOC vs Power Demand

(Source: Cummins)

Load	Power	SFOC	FOC
%	kw	kg/kwh	L/h
10	16	0.300	5.8
25	41	0.251	12.1
50	82	0.216	20.8
75	123	0.212	30.7
100	164	0.214	41.3

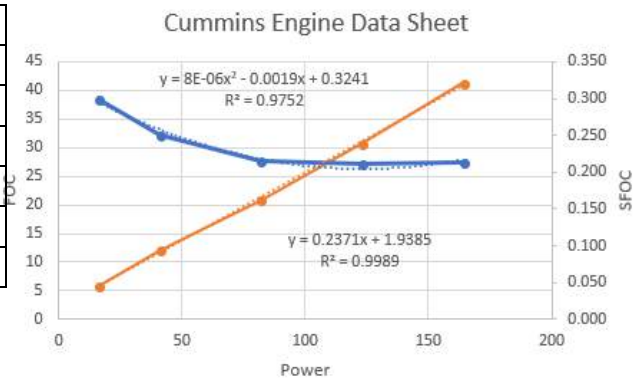


Figure 4.5 FOC and SFOC vs Power Demand Diagram

From the figure 4.5 shown the relation between fuel oil consumption vs power demand are linear with the regression line (R^2) = 0.9989 and the formula is :

$$y = 0.2371x + 1.9385 \qquad (4.9)$$

with x : power demand (Kw)
y : fuel oil consumption (L/h)

and the relation between specific fuel oil consumption (sfoc) vs engine load are polynomial with the regression line (R^2) = 0.9752 and the formula is :

$$y = 8E\text{-}06x^2 - 0.0019x + 0.3241 \qquad (4.10)$$

with x : power demand (Kw)
y : specific fuel oil consumption (g/kwh)

2. KT KRESNA 315

Auxiliary Engine : Two (2) units of 186 KW DOOSAN ; 1800 rpm

Table 4.6 FOC and SFOC vs Power Demand

(Source: Doosan)

Load	Power	FOC
%	kw	L/h
100	186	46

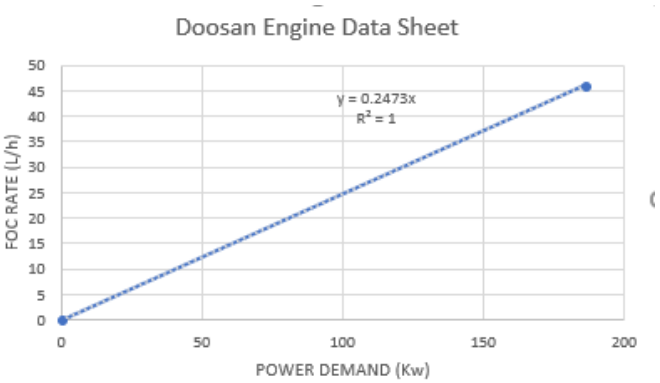


Figure 4.6 FOC and SFOC vs Power Demand Diagram

From the figure 4.6 shown the relation between fuel oil consumption vs power demand are linear with the regression line (R^2) = 0.9989 and the formula is :

$$y = 0.2473x \qquad (4.11)$$

with x : power demand (Kw)

y : fuel oil consumption (L/h)

4.1.4. Operational Daily Report

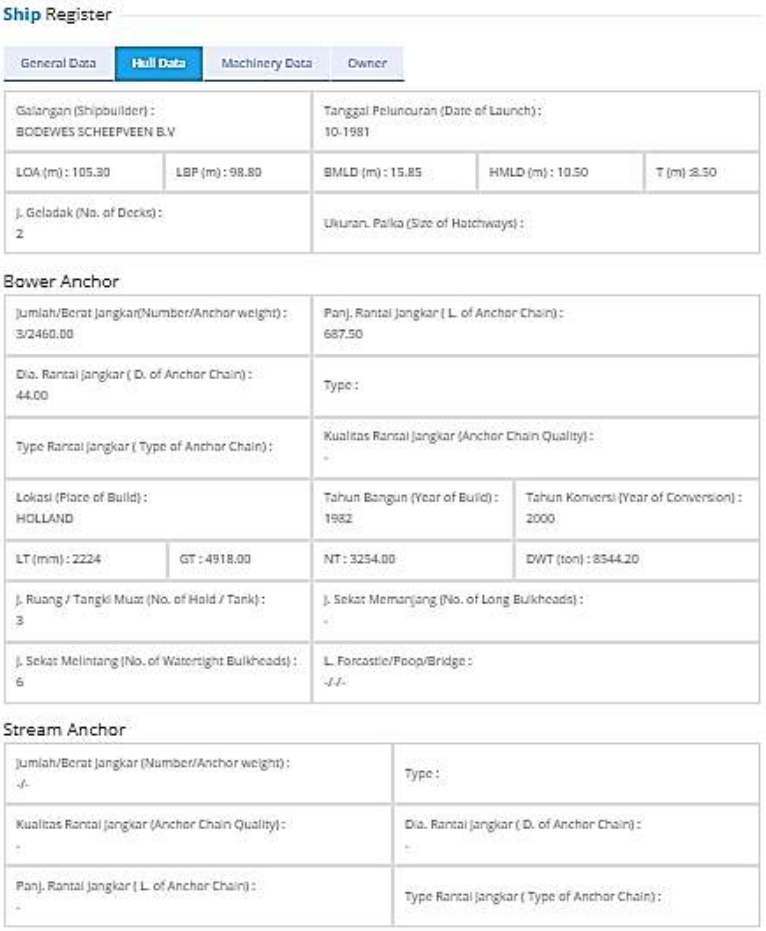
PT. ABC are collected daily operational report of harbour tug whether in operation or not. There are several information that obtained using this report :

- Ship in service (push/tow)
- Operation time
- Location of service
- Engine operation time
- Fuel Oil Consumption (Daily Operation)

The data has been collected need to be calculated for this thesis.

4.1.5. Ship Principal Dimension

Ship Principal Dimension is used to estimate lateral projected wind area that obtain from several source such as AIS Data Provider (VT Explorer, Marine Traffic, Fleetmon) and Ship Classification as can be seen in figures 4.7 and 4.8.



Ship Register

General Data | **Hull Data** | Machinery Data | Owner

Galangan (Shipbuilder) : BODEWES SCHEEPVEEN B.V		Tanggal Peluncuran (Date of Launch) : 10-1981		
LOA (m) : 105.30	LBP (m) : 98.80	BMLD (m) : 15.85	HMLD (m) : 10.50	T (m) :8.50
J. Geladak (No. of Decks) : 2		Ukuran. Palka (Size of Hatchways) :		

Bower Anchor

Jumlah/Berat Jangkar(Number/Anchor weight) : 3/2460.00		Panj. Rantai Jangkar (L. of Anchor Chain) : 687.50	
Dia. Rantai Jangkar (D. of Anchor Chain) : 44.00		Type :	
Type Rantai Jangkar (Type of Anchor Chain) :		Kualitas Rantai Jangkar (Anchor Chain Quality) : -	
Lokasi (Place of Build) : HOLLAND		Tahun Bangun (Year of Build) : 1982	Tahun Konversi (Year of Conversion) : 2000
LT (mm) : 2224	GT : 4918.00	NT : 3254.00	DWT (ton) : 8544.20
J. Ruang / Tangki Muat (No. of Hold / Tank) : 3		J. Sekat Memanjang (No. of Long Bulkheads) : -	
J. Sekat Melintang (No. of Watertight Bulkheads) : 6		L. Forcastle/Poop/Bridge : -/-/-	

Stream Anchor

Jumlah/Berat Jangkar (Number/Anchor weight) : -/-	Type :
Kualitas Rantai Jangkar (Anchor Chain Quality) : -	Dia. Rantai Jangkar (D. of Anchor Chain) : -
Panj. Rantai Jangkar (L. of Anchor Chain) : -	Type Rantai Jangkar (Type of Anchor Chain) :

Figure 4.7 BKI Ship Particular
(Source: bki.co.id)

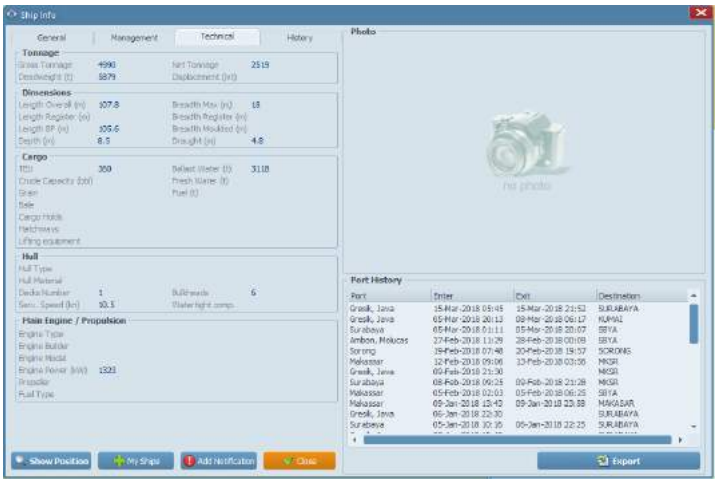


Figure 4.8 MV. Curug Mas Ship Particular
(Source: VT Explorer)

The result for principal dimension of are shown in the table below :

1. KT. BIMA 333 (01-10-2017)

Table 4.7 Ship Principal Dimension Based on daily operation KT. BIMA 333
(Source: BKI , Marine Traffic, Fleetmon, VT Explorer)

No	Ship Name	Type	LOA	LBP	B
1	UNI FORTUNA	CON	238	226	32
2	CURUG MAS	CON	105	99	16
3	MITRA PROGRES 3	CON	101	96	19
4	CAPE FULMAR	CON	170	161	25
5	TELUK BERAU	CON	114	108	16
6	NAVIGATOR ARIES	LPG	160	151	26
7	TANTO DAMAI	GC	127	119	20
8	SINAR BELAWAN	CON	146	137	25
9	CAPE FULMAR	CON	170	161	25
10	ORIENTAL DIAMOND	CON	196	187	30
11	MENTARI SENTOSA	GC	101	94	19
12	TANTO RAYA	CON	121	112	20
13	BEETHOVEN	CON	209	198	30
14	OLYMPIA	CON	215	205	30

2. KT. KRESNA 315 (01-10-2017)

Table 4.8 Ship Principal Dimension Based on daily operation KT. KRESNA 315
(Source: BKI , Marine Traffic, Fleetmon, VT Explorer)

No	Ship Name	Type	LOA	LBP	B
1	TANTO FAJAR 1	GC	97.8	90.5	17.3
2	TANTO SEMANGAT	CON	140.0	132.9	20.5
3	MERATUS MALINO	CON	149.6	140.8	23.1
4	AWLI	CON	131.3	120.5	23.0
5	MENTAYA RIVER	CON	101.3	92.6	17.0
6	RED ROCK	GC	100.0	95.9	16.2
7	SINAR BELAWAN	CON	145.7	137.2	25.0
8	KOTA JUTA	CON	193.0	181.5	28.0
9	SPIL NIKEN	CON	208.0	197.3	29.0
10	SPIL NITA	CON	207.2	196.5	29.8
11	PAN DAISY	BC	179.0	172.4	28.0
12	SEASPAN FRASER	CON	265.0	252.0	32.3
13	UNI FORTUNA	CON	238.0	226.4	32.0

4.1.6. Bollard Pull Test

As a mandatory, bollard pull test should be held to obtained bollard pull certificate. In this test is to shown maximum ability of harbour tugs to tow/push the ship when approaching port. Form this test, shown the correlation of bollard pull ability of harbour tug vs engine load from bollard pull test held by shipyard or ship classification.

1. KT. BIMA 333

Table 4.9 Engine Load and RPM vs Bollard Pull
(Source: Shipyard)

NO	BOLLARD TEST	ENGINE LOAD
	(ton)	%
1	15.7	25
2	25.2	50
3	32.5	75
4	35.5	85
5	38.3	100
6	41.9	110

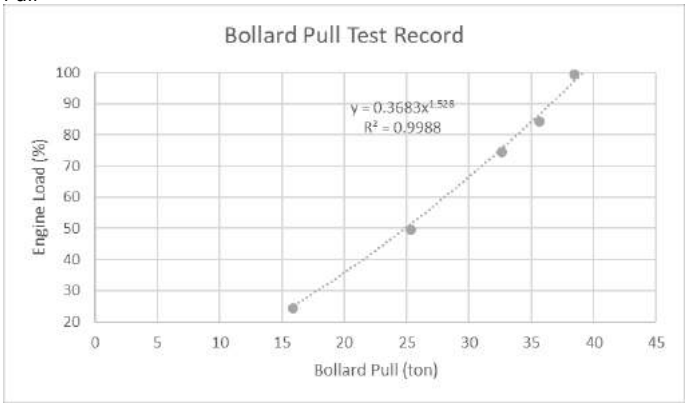


Figure 4.9 Engine Load and RPM vs Bollard Pull Diagram

Form test data by shipyard as can be seen on table 4.9 and figure 4.9, its shown the relation between engine load vs bollard pull are exponential, the value of regression line (R^2) = 0.9988 with formula :

$$y = 0.3683x^{1.528} \qquad (4.12)$$

with x : Bollard Pull (ton)
y : Engine Load (%)

2. KT. KRESNA 315

Table 4.10 Engine Load vs Bollard Pull
(Source: Shipyard)

NO	BOLLARD PULL TEST	ENGINE LOAD
	(ton)	%
1	18.7	25
2	29.64	50
3	38.86	75
4	48.65	100

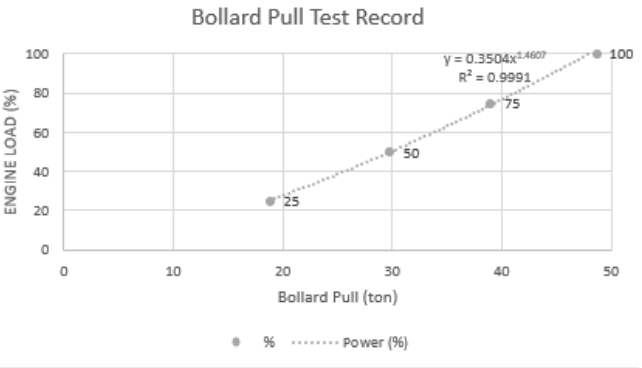


Figure 4.10 Bollard Pull Test

Form test data by shipyard as can be seen on table 4.10 and figure 4.10, its shown the relation between engine load vs bollard pull are exponential, the value of regression line (R^2) = 1 with formula :

$$y = 0.3504x^{1.4607} \qquad (4.13)$$

with x : Bollard Pull (ton)
y : Engine Load (%)

4.1.7. AIS Data

The data are collected using AIS Data Provider (AIS ITS, BigOcean Data and Genscape Vessel Tracking) to obtained position and time of harbour tug, also draught of vessel when towage operation based on daily report to perform detail calculation as shown on figures 4.11 and 4.12.

Vessel Name	IMO	MMSI	Latitude	Longitude	Date	Direction	Degrees	Speed	Position Source	Temperature (°C)	Pressure reduced to MSL (hPa)	Visibility (m)	Wind Speed (m/s)	Wind Direction (°)	Current Speed (m/s)	Current Direction (°)	Water Temperature (°C)	Significant height of combined wind (m)	Direction of wind waves (°)	Significant height of wind waves (m)	Mean period of wind waves (s)	Direction of swell waves (°)	Significant height of swell waves (m)	Mean period of swell waves (s)	Total Precipitation Probability (%)
KTBIMA 333	9588225	5.25E+08	07° 12.506' S	112° 43.572' E	01-10-2017 00:02:08 +00:00	W	281	0	T-AIS	27.6	101240	32600	2.06	12	0	0	28.8	0.6	192	0.5	3	103	0.4	4	9
KTBIMA 333	9588225	5.25E+08	07° 12.506' S	112° 43.571' E	01-10-2017 00:17:18 +00:00	W	281	0	T-AIS	27.6	101240	32600	2.06	12	0	0	28.8	0.6	192	0.5	3	103	0.4	4	9
KTBIMA 333	9588225	5.25E+08	07° 12.506' S	112° 43.571' E	01-10-2017 00:33:28 +00:00	W	281	0	T-AIS	27.6	101240	32600	2.06	12	0	0	28.8	0.6	192	0.5	3	103	0.4	4	9
KTBIMA 333	9588225	5.25E+08	07° 12.506' S	112° 43.569' E	01-10-2017 00:50:18 +00:00	W	281	0	T-AIS	27.6	101240	32600	2.06	12	0	0	28.8	0.6	192	0.5	3	103	0.4	4	9
KTBIMA 333	9588225	5.25E+08	07° 12.506' S	112° 43.571' E	01-10-2017 00:50:57 +00:00	W	281	0	S-AIS	27.6	101240	32600	2.06	12	0	0	28.8	0.6	192	0.5	3	103	0.4	4	9

Figure 4.11 AIS DATA KT. BIMA 333

(Source: bigoceandata.com)

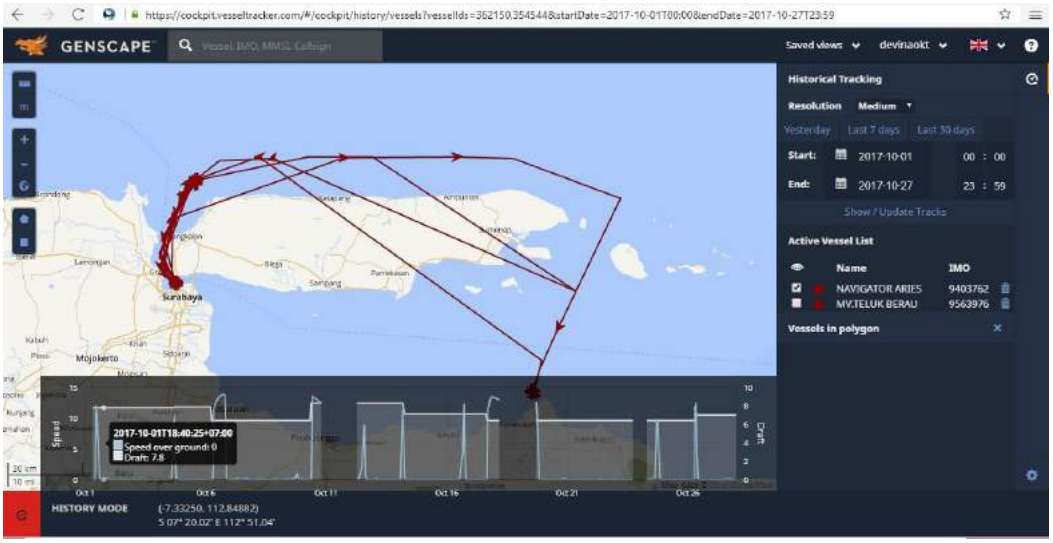


Figure 4.12 Genscape AIS Data

(Source: genscape vessel tracker)

From figure above, real time draught of vessel (Navigator Aries) from 01-10-2017 at 18.40 (at time of towing service) is obtained. Draught of this vessel is 7.8 m. The results are in the figure below :

Table 4.11 Draft (KT. BIMA 333 at 1-October-2018)

(Source: Genscape Vessel Tracker)

No	Ship Name	Type	Draught
1	UNI FORTUNA	CON	7.9
2	CURUG MAS	CON	5.1
3	MITRA PROGRES 3	CON	6.5
4	CAPE FULMAR	CON	8.3
5	TELUK BERAU	CON	5.0
6	NAVIGATOR ARIES	LPG	7.8
7	TANTO DAMAI	GC	6.5
8	SINAR BELAWAN	CON	6.5
9	CAPE FULMAR	CON	8.3
10	ORIENTAL DIAMOND	CON	8.0
11	MENTARI SENTOSA	GC	6.9
12	TANTO RAYA	CON	6.0
13	BEETHOVEN	CON	10.7
14	OLYMPIA	CON	11.6

Table 4.12 Draft (KT. KRESNA 315 at 1-October-2018)

(Source: Genscape Vessel Tracker)

No	Ship Name	Type	Draught
1	TANTO FAJAR 1	GC	6.0
2	TANTO SEMANGAT	CON	7.8
3	MERATUS MALINO	CON	6.8
4	AWLI	CON	7.7
5	MENTAYA RIVER	CON	6.4
6	RED ROCK	GC	5.5
7	SINAR BELAWAN	CON	6.5
8	KOTA JUTA	CON	8.2
9	SPIL NIKEN	CON	7.5
10	SPIL NITA	CON	7.5
11	PAN DAISY	BC	9.8
12	SEASPAN FRASER	CON	8.6
13	UNI FORTUNA	CON	7.6
14	TANTO FAJAR 1	GC	6.0

To obtained time operation of harbor tug, AIS Data collected from AIS ITS are plotted into ARG GIS Online to shown tugboat position and time operation more accurately as shown in figures 4.13 and 4.14.

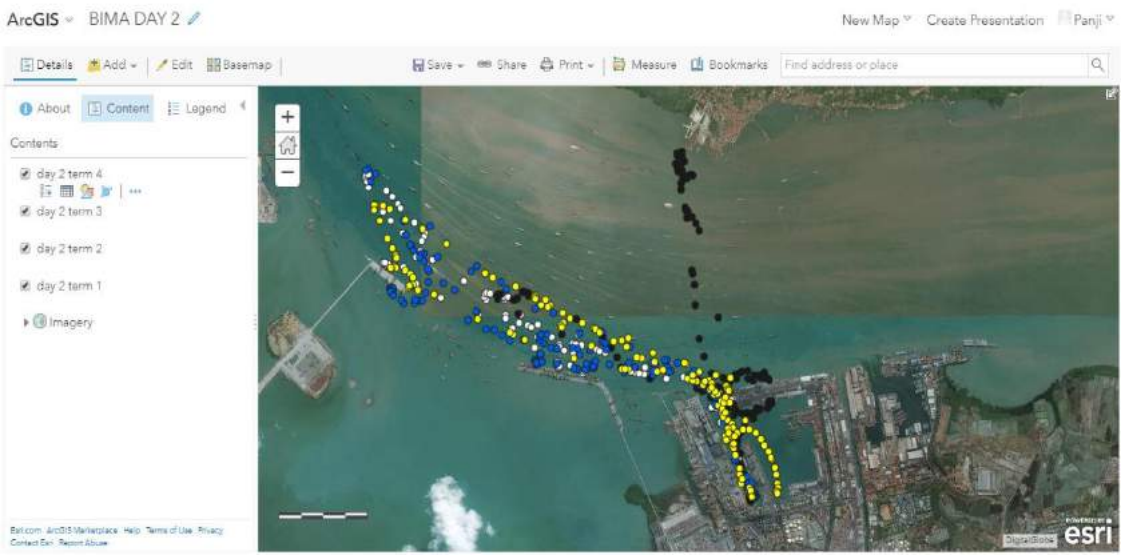


Figure 4.13 KT. Bima 333 Ploted AIS Data
(Source: ARC GIS)

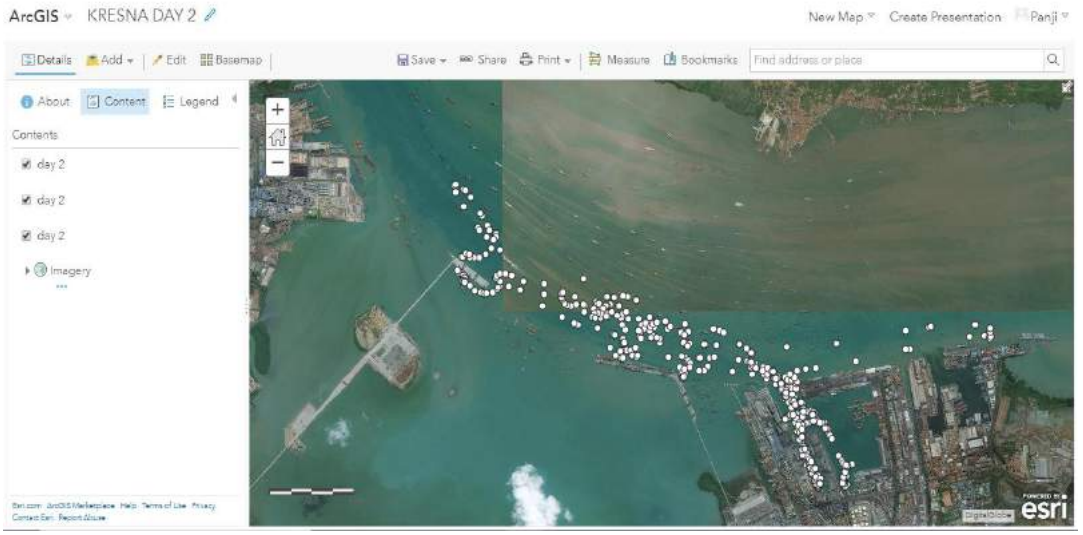


Figure 4.14 KT. Kresna 315 Ploted AIS Data
(Source: ARC GIS)

From the trajectory of harbor tug position and time is obtained operation time data and this data are used for calculate fuel oil consumption.

Here the result of trajectory AIS Data :

Table 4.13 Trajectory AIS Data KT. BIMA 333

NO	LOCATION		OP TIME		SERVICE TIME		QUAY	TRANSIT	SERVICE	TOTAL
	FROM	TO	START	END	START	END	minutes	minutes	minutes	minutes
1	RD	ICT	23.34	01.20	00.09	01.06		52	56	108
2	JS	RD	01.40	02.00	01.49	01.59	20	10	10	20
3	BU	RD	02.00	02.57	02.04	02.25		26	21	47
4	RD	TL	03.44	05.13	04.14	04.47	47	44	33	77
5	BT	RD	08.04	08.32	08.22	08.28	167	22	5	27
6	AKR	RD	09.43	10.36	09.55	10.17	71	34	22	56
7	RD	MRH	10.59		11.13	11.49	23	14	36	50
8	RD	TL		13.12	12.20	12.48		55	28	83
9	TL	RD	13.40		14.10	14.21	28	30	11	41
10	RD	NT		16.10	14.42	15.45		21	57	78
11	BB	RD	17.06	18.06	17.18	17.43	56	35	35	70
12	BB	RD	19.03	19.31	19.12	19.25	57	18	13	31
13	RD	ICT	22.15		22.32	23.09	149	17	37	54
14	RD	ICT		00.29	23.46	00.29		37	43	80

Table 4.14 Trajectory AIS Data KT. KRESNA 315

NO	LOCATION		OP TIME		SERVICE TIME		QUAY	TRANSIT	SERVICE	ACTUAL
	FROM	TO	START	END	START	END	minutes	minutes	minutes	minutes
1	RD	BB	00.40	02.05	01.15	02.00		40	35	75
2	TL	RD	02.38		03.10	03.34	118	32	24	56
3	RD	TL		04.36	03.41	04.11		5	30	35
4	JU	RD	07.50	08.30	08.06	08.12	194	35	35	70
5	MRH	RD	09.03	09.58	09.19	09.30	33	34	11	45
6	RD	MRH	10.10		10.26	11.09		16	43	59
7	RD	TL			12.23	12.47		14	24	38
8	ICT	RD			13.19	13.32		31	13	44
9	BT	RD		15.15	14.23	15.03		63	40	103
10	RD	BB	17.40	19.06	18.12	18.53	85	45	41	86
11	RD	JU	19.58	21.00	20.10	20.48	52	12	38	50
12	ICT	RD	22.07		22.47	23.19	67	40	32	72
12	ICT	RD		24.30	23.29	23.39		20	10	30

There are several information that can be obtained form AIS Data, such as:

1. Location = Location of tug when operating its task
2. Operating Time = The time when harbour tug starting engine and ended its task
3. Service Time = The time when harbour tug doing pull/push operation
4. Quay = The time when harbour tug boat in its station and stop main engine
5. Transit = The time when tug reach the targeted ship and leave targeted ship when operation finished to go over its station or perform next operation

Trajectory AIS data with daily report are compared , as a result there is differences between time recorded on daily report and trajectory AIS Data in many cases of operation time.

Table 4.15 Recorded AIS Data

From	To	Service Time	
RD	Mirah	11.13	11.49

Table 4.16 Recorded Daily Record

(Source: PT. ABC)

From	To	Service Time	
RD	Mirah	11.00	11.55

In recorded AIS Data as depicted in table 4.15, at 11.49 KT. BIMA 333 is left from Mirah port and the daily report recorded as depicted in table 4.16, at 11.55, this differences between AIS Data and Daily report is because human error or there is no platform to recorded real time.

4.1.8. Weather Hindcast Data

To perform detail calculation, a hindcast data is needed to simulate real environment condition in that time in order to obtained accuracy of calculation, there 3 parameter :

1. Wind

The wind speed hindcast data comes from the Meteorogical, Climatological, and Geophysical Agency Indonesia (BMKG) from 1/10/2017 to 31/10/2017 as shown in table 4.17.

Table 4.17 Wind Velocity

(Source: BMKG)

Nama Stasiun	Tanggal	Kecepatan Angin Rata-rata (knot)	Arah Angin Terbanyak (deg)
Stasiun Meteorologi Maritim Perak II	01/10/2017	2	E
Stasiun Meteorologi Maritim Perak II	02/10/2017	2	S
Stasiun Meteorologi Maritim Perak II	03/10/2017	2	SE
Stasiun Meteorologi Maritim Perak II	04/10/2017	2	SE
Stasiun Meteorologi Maritim Perak II	05/10/2017	2	NE
Stasiun Meteorologi Maritim Perak II	06/10/2017	2	SE
Stasiun Meteorologi Maritim Perak II	07/10/2017	2	E
Stasiun Meteorologi Maritim Perak II	08/10/2017	2	E
Stasiun Meteorologi Maritim Perak II	09/10/2017	2	E
Stasiun Meteorologi Maritim Perak II	10/10/2017	2	E

2. Wave

The wave height and period hindcast data comes from the datasets are provided by BigOcean Data as shown in figures 4.15 and 4.16

Vessel Name	Latitude	Longitude	Date	Significant height of combined wind (m)	Direction of wind waves (°)	Significant height of wind waves (m)	Mean period of wind waves (s)	Direction of swell waves (°)	Significant height of swell waves (m)	Mean period of swell waves (s)
KTBIMA 333	07° 12.506' S	112° 43.572' E	01-10-2017 00:02:08 +00:00	0.6	192	0.5	3	103	0.4	4
KTBIMA 333	07° 12.506' S	112° 43.571' E	01-10-2017 00:17:18 +00:00	0.6	192	0.5	3	103	0.4	4
KTBIMA 333	07° 12.506' S	112° 43.571' E	01-10-2017 00:33:28 +00:00	0.6	192	0.5	3	103	0.4	4
KTBIMA 333	07° 12.506' S	112° 43.569' E	01-10-2017 00:50:18 +00:00	0.6	192	0.5	3	103	0.4	4

Figure 4.15 KT. Bima 333 Wave Data

(Source: BigOcean Data)

Vessel Name	Latitude	Longitude	Date	Significant height of combined wind (m)	Direction of wind waves (°)	Significant height of wind waves (m)	Mean period of wind waves (s)	Direction of swell waves (°)	Significant height of swell waves (m)	Mean period of swell waves (s)
KTKRESNA315	07° 12.506' S	112° 43.558' E	01-10-2017 00:03:20 +07:00	0.7	126	0.6	3	99	0.4	4
KTKRESNA315	07° 12.503' S	112° 43.562' E	01-10-2017 00:18:28 +07:00	0.7	126	0.6	3	99	0.4	4
KTKRESNA315	07° 12.503' S	112° 43.559' E	01-10-2017 00:38:40 +07:00	0.7	126	0.6	3	99	0.4	4
KTKRESNA315	07° 12.504' S	112° 43.559' E	01-10-2017 00:39:38 +07:00	0.7	126	0.6	3	99	0.4	4

Figure 4.16 KT. Kresna 315 Wave Data

(Source: BigOcean Data)

3. Tides Current

Ocean current hindcast data from dataset provided by UK Hydrographic Office as shown in figure 4.17. Ocean tides current average data from 01-October-2017 until 31- October- 2017 are found. For Example here the results of data in 01-October-2017 :

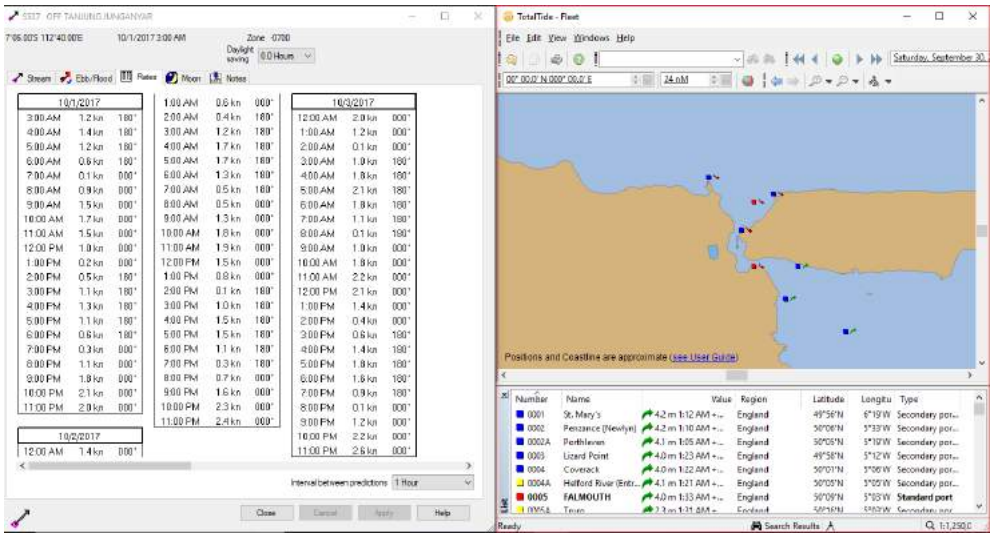


Figure 4.17 Admirality Total Tide

(Source: UK Hidrographic Office)

From figure , ocean tides current average for 01-October-2017 is 0.53 m/s

4.2. Calculation Process

There are several steps to calculate fuel oil consumption of habour tug such as calculating total lateral projected area, bollard pull required, engine load, and fuel oil consumption perday

4.2.1. Calculation Total Lateral Projected Area

To calculate wind resistance, it's need to estimate parameter representing above water structural shape of ship in service of harbour tug by an approach conducted by kitamura (Kitamura, 2017) using regression coefficient depicted in the tables 4.18 and 4.19 to estimate total lateral projecter area (AL) :

Table 4.18 Regression Parameter 1
(Source: Kitamura, 2017)

Parameter	Input	Ship type	Tanker (ballast)	Tanker (full)	Bulker (ballast)	Bulker (full)
AL	LOA and B	Form	4	4	1	1
		a	0.000E-00	0.000E-00	1.792E+01	2.606E+01
		b	−3.211E-05	−3.303E-05	1.140E+00	−2.447E+00
		c	2.571E-02	2.094E-02	−7.515E+01	2.183E+02

Table 4.19 Regression Parameter 2
(Source: Kitamura, 2017)

Parameter	Input	Ship type	LNG (ballast)	LNG (full)	Container (full)	Passenger	Others
AL	LOA and B	Form	3	3	3	6	3
		a	1.132E+00	1.018E-00	0.000E-00	−2.765E-02	−5.127E+01
		b	−6.409E-02	−5.437E-02	8.992E-02	5.182E-03	8.065E+02
		c	4.221E-00	4.203E-00	8.500E+00	8.259E-01	-6.399E+01

with 'a', 'b' and 'c' are coefficients of the regression expression this need to be entry to this formula :

$$X(\text{output}) = aB + bLOA + c \qquad (4.14)$$

Form formula above, total lateral projected area (AL) defines as parameter (P) to be estimated in terms 'form' that defines by this formula :

1: X = P (parameter, raw) (4.15)

2: X = P/LOA (4.16)

3: X = P/B (4.17)

4: X = P/LOA (4.18)

5: X = P/(LOA . B) (4.19)

6: $X = P/B^2$ (4.20)

For example from daily operational report of KT. Bima 333 01-October-2017 as shown in table 4.20 :

Table 4.20 Ship Principal Ninja
(Source: Fleetmo, VT Explorer)

SHIP NAME	TYPE	LOA	B
		m	m
SINAR BELAWAN	CON	146	25

From table x. parameter for container ship are :

Form : 3

a: 0.000E-00

b: 8.992E-02

c: 8.500E+00

So regresion formula based on equation (4.14) is,

X(output)= aB + bLOA + c (4.14)

X(output)= 0 x 25 + 8.992E-02 x 146+ 8.500E+00

X(output)= 21.60

Input X value in term of 'form' based on number formula (4.17),

X = P/B (4.17)

21.60 = P / 25

P = 25 x 21.60

P = 539.99

So total lateral projected area is P = AL = 539.99

Here is the result of KT. Bima 333 and KT. Kresna 315 :

Table 4.21 AF of ship in service KT. BIMA 333

DATE	NO	SHIP NAME	TYPE	LOA	B	AL
				m	m	m^2
Sunday, 01 October 2017	1	UNI FORTUNA	CON	238.00	32.00	956.83
	2	CURUG MAS	CON	105.30	15.85	284.80
	3	MITRA PROGRES 3	CON	100.60	18.80	329.86
	4	CAPE FULMAR	CON	170.03	25.18	599.01
	5	TELUK BERAU	CON	114.30	16.00	300.45
	6	NAVIGATOR ARIES	LPG	159.97	25.63	589.02
	7	TANTO DAMAI	GC	126.64	19.80	393.77
	8	SINAR BELAWAN	CON	145.68	25.00	539.99
	9	CAPE FULMAR	CON	170.03	25.18	599.01
	10	ORIENTAL DIAMOND	CON	195.60	30.20	787.87
	11	MENTARI SENTOSA	GC	101.10	18.80	330.71
	12	TANTO RAYA	CON	120.84	20.20	391.19
	13	BEETHOVEN	CON	208.91	30.08	820.74
	14	OLYMPIA	CON	215.29	29.80	830.19

Table 4.22 AL of ship in service KT. KRESNA 315

DATE	NO	SHIP NAME	TYPE	LOA	B	AL
				m	m	m^2
Sunday, 01 October 2017	1	TANTO FAJAR 1	GC	97.80	17.30	299.19
	2	TANTO SEMANGAT	CON	140.00	20.50	432.32
	3	MERATUS MALINO	CON	149.60	23.10	507.09
	4	AWLI	CON	131.33	22.97	466.50
	5	MENTAYA RIVER	CON	101.30	17.00	299.35
	6	RED ROCK	GC	99.95	16.20	283.30
	7	SINAR BELAWAN	CON	145.68	25.00	539.99
	8	KOTA JUTA	CON	193.03	28.00	724.00
	9	SPIL NIKEN	CON	208.00	29.00	788.90
	10	SPIL NITA	CON	207.20	29.80	808.52
	11	PAN DAISY	BC	179.00	28.00	688.68
	12	SEASPAN FRASER	CON	265.04	32.25	1042.72
	13	UNI FORTUNA	CON	238.00	32.00	956.83
	14	TANTO FAJAR 1	GC	97.80	17.30	299.19

4.2.2. Calculation Bollard Pull Required

Captain hensen method (Hensen, 2003) is used to calculate bollard pull required, there are 3 main factor influencing total bollard pull required for particular ship :

1. Wind Force (F_{wind})
2. Wave Force (F_{wave})
3. Current Force ($F_{current}$)
4. Mooring Force (F_{moor})

These factor depend on enviromental condition by gathering data from several hindcast data source and principal dimension of ship, draft, underkeel clereance, etc. For example MV. Sinar Belawan will be calculate in this thesis:

1. Wind Force

The following formula to estimate bollard pull required for beam winds :

$$Fw = 0.08\ V^2 AL \text{ kgf} \qquad (4.21)$$

Where,
V : Wind velocity in m/sec
A_L : Longitudinal wind area in m^2

Form hindcast data has been colected form hindcast data provide by meteorological station in port of tanjung perak shown average wind velocity is 2 knots or 1,03 m/s in 1-October-2017

And based on calculation before, AL of MV. Sinar Belawan : 539.99m^2

So wind force is :

F_{wind} = 0.08 x $1{,}03^2$ x 539.99= 45.73 kgf = 45.73 kgf / 1000 = 0.4573 ton

2. Wave Force

The simplified formula for rougly calculating the bollard pull required to hold a ship up against short period beam waves reads :

$$Fwave = 112\ L\ Hs^2 \text{ kgf} \qquad (4.22)$$

Form hindcast data has been colected form hindcast data provide by BigOcean Data for sighnificant wave height to calculate wave force on MV. Sinar Belawan on 1-October-2017, Obtained the wave height 0.4 m and LOA = 105.30. so the calculation is,

F_{wave}= 112 x 146 x 0.4^2 = 2,458 kgf = 2,458 / 1000 = 2.458 ton

3. Current Force

The formula to calculate current force is depend on ratio between water depth and draft of ship, With underkeel clereance decreased to 1.5 x ship's draft bollard pull required roughly :

$$Fc = 110\ V^2 LBP\ T \text{ kgf} \qquad (4.23)$$

Where,

V : Current Velocity in m/sec

L_{bp} : Length between perpendiculars in m

T : Draft

In this case from forecast data sea current velocity is 0.68 m/s, LBP of MV. Sinar Belawan is 137 m

$$Fc = 110\ V^2 LBP\ T \text{ kgf} \qquad (4.24)$$

Fcurrent = 110 x 0.53^2 x 137 x 6.5 = 41,107 kgf = 41,107 / 1000 = 41.11 ton

4. Mooring Force

Berth constuction can affect to stop a drifting ship (Hensen, 2003) provide a rough calculation to measure this force :

$$\text{Fmoor} = \frac{0.07\ D\ x\ V^2}{S} \qquad (4.25)$$

Where,

V : Initial Speed in m/sec. assumed : 0,5 knots / 0.25 m/s

D : Displacement in ton

S : Stopping distance in m, assumed : 30 m harbour tug start drifting the ship

Before calculate mooring force , the next step is calculate ship displacement using this formula :

$$D = L_{bp} \text{ x } B \text{ x } T \text{ x } Cb \text{ x } \gamma \qquad (4.26)$$

Due to lack information of Cb of the ship so an assumption is needed by using typical Cb provided by Barras (Barras, 2001)

Ship type	Typical C_b fully-loaded	Ship type	Typical C_b fully-loaded
ULCC	0.850	General Cargo ships	0.700
Supertankers	0.825	Passenger Liners	0.625
Oil tankers	0.800	Container ship/RoRo	0.575
Bulk carriers	0.750	Tugs	0.500

Figure 4.18 Typical Cb
(Source: Barras, 2000)

Adding ship principal dimension , the displacement of MV. Sinar Belawan is , 13141.07 ton

So Fmoor is,

$$\text{Fmoor} = \frac{0.07 \; x \; 13141.07 \; x \; 0.25^2}{30} = 1.92 \text{ ton}$$

So the total force of MV. Sinar Balawan is :

Total Bollard Pull Required = Fwind + Fwave + Fcurrent + Fmoor (ton)

= 0.4573 ton + 2.458 ton + 41.11 ton + 1.92 ton

= 32.48 ton

In this case KT. Kresna 309 is also assisting this ship so total bollard pull required is divided by 2 = 32.48 ton / 2 = 16.24 ton , load that received by KT. BIMA 333.

Here the results of KT. BIMA 333 and KT. Kresna 315 on 1-October-2017 (The results of calculation can be seen on Attachment 1) :

Here the results of KT. BIMA 333 and KT. Kresna 315 on 1-October-2017 (The results of calculation can be seen on Attachment 1) :

Table 4.23 Bollard pull required KT. BIMA 333

DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Sunday, 01 October 2017	1	UNI FORTUNA	CON	238	226	32	7.9	956.83	1.03	0.08	0.53	56.38	0.40	4.06	0.575	4.92	65.44	OV	32.72
	2	CURUG MAS	CON	105	99	16	5.1	284.80	1.03	0.02	0.529	15.54	0.40	1.77	0.575	0.69	18.02	K.306	9.01
	3	MITRA PROGRES 3	CON	101	96	19	6.5	329.86	1.03	0.03	0.529	19.61	0.40	1.72	0.575	1.01	22.37	OV	11.18
	4	CAPE FULMAR	CON	170	161	25	8.3	599.01	1.03	0.05	0.529	41.95	0.40	2.88	0.575	2.89	47.76	OV	23.88
	5	TELUK BERAU	CON	114	108	16	5.0	300.45	1.03	0.03	0.529	16.93	0.40	1.93	0.575	0.74	19.62	KTJ	9.81
	6	NAVIGATOR ARIES	LPG	160	151	26	7.8	589.02	1.03	0.05	0.529	37.04	0.40	2.70	0.800	3.61	43.41	TI	21.70
	7	TANTO DAMAI	GC	127	119	20	6.5	393.77	1.03	0.03	0.529	24.32	0.40	2.13	0.700	1.60	28.09	FI	14.04
	8	SINAR BELAWAN	CON	146	137	25	6.5	539.99	1.03	0.05	0.529	28.06	0.40	2.46	0.575	1.92	32.48	K.315	16.24
	9	CAPE FULMAR	CON	170	161	25	8.3	599.01	1.03	0.05	0.529	41.11	0.40	2.88	0.575	2.89	46.92	TI	23.46
	10	ORIENTAL DIAMOND	CON	196	187	30	8.0	787.87	1.03	0.07	0.529	47.10	0.40	3.35	0.575	3.89	54.41	TI	27.21
	11	MENTARI SENTOSA	GC	101	94	19	6.9	330.71	1.03	0.03	0.529	20.48	0.40	1.69	0.700	1.28	23.48	KTJ	11.74
	12	TANTO RAYA	CON	121	112	20	6.0	391.19	1.03	0.03	0.529	21.08	0.40	2.00	0.575	1.16	24.28	FI	12.14
	13	BEETHOVEN	CON	209	198	30	10.7	820.74	1.03	0.07	0.529	66.72	0.40	3.55	0.575	5.48	75.82	K.306	37.91
	14	OLYMPIA	CON	215	205	30	11.6	830.19	1.03	0.07	0.529	74.92	0.40	3.68	0.575	6.10	84.77	K.306	42.39

Table 4.24 Bollard pull required KT. BIMA 333

DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	Fmoor	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Sunday, 01 October 2017	1	TANTO FAJAR 1	GC	97.8	90.5	17.3	6.0	299.19	1.03	0.03	0.5294	16.74	0.40	1.62	0.7	0.98	19.37	RU	9.69
	2	TANTO SEMANGAT	CON	140.0	132.9	20.5	7.8	432.32	1.03	0.04	0.5294	31.97	0.40	2.38	0.575	1.83	36.22	TBN	18.11
	3	MERATUS MALINO	CON	149.6	140.8	23.1	6.8	507.09	1.03	0.04	0.5294	29.51	0.40	2.52	0.575	1.9	33.98	TBN	16.99
	4	AWLI	CON	131.3	120.5	23.0	7.7	466.50	1.03	0.04	0.5294	28.61	0.40	2.16	0.575	1.83	32.65	TBN	16.32
	5	MENTAYA RIVER	CON	101.3	92.6	17.0	6.4	299.35	1.03	0.03	0.5294	18.27	0.40	1.66	0.575	0.87	20.82	DINI	10.41
	6	RED ROCK	GC	100.0	95.9	16.2	5.5	283.30	1.03	0.02	0.5294	16.26	0.40	1.72	0.7	0.89	18.90	DINI	9.45
	7	SINAR BELAWAN	CON	145.7	137.2	25.0	6.5	539.99	1.03	0.05	0.5294	27.50	0.40	2.46	0.575	1.92	31.92	B.333	15.96
	8	KOTA JUTA	CON	193.0	181.5	28.0	8.2	724.00	1.03	0.06	0.5294	45.90	0.40	3.25	0.575	3.58	52.80	TBN	26.40
	9	SPIL NIKEN	CON	208.0	197.3	29.0	7.5	788.90	1.03	0.07	0.5294	45.62	0.40	3.54	0.575	3.69	52.91	OVI	26.46
	10	SPIL NITA	CON	207.2	196.5	29.8	7.5	808.52	1.03	0.07	0.5294	45.45	0.40	3.52	0.575	3.77	52.81	K.306	26.41
	11	PAN DAISY	BC	179.0	172.4	28.0	9.8	630.7	1.03	0.05	0.5294	52.11	0.40	3.09	0.75	5.3	60.55	K.306	30.28
	12	SEASPAN FRASER	CON	265.0	252.0	32.3	8.6	1042.72	1.03	0.09	0.5294	66.83	0.40	4.52	0.575	6.01	77.44	TBN	38.72
	13	UNI FORTUNA	CON	238.0	226.4	32.0	7.6	956.83	1.03	0.08	0.5294	53.04	0.40	4.06	0.575	4.73	61.91	TBN	30.96

4.2.3. Calculation Engine Load Required

After calculate total bollard pull based on daily operational report. Based on regression formula is from bollard pull test record of KT.BIMA 333 equation (4.12) and equation (4.13) for KT. Kresna 315.

For example estimated bollard pull required for MV.Sinar Belawan is 16.4 ton so engine load that received to harbour tug engine based on equation (4.12) for KT. Bima 333 is :

$y = 0.3683x^{1.528}$ (4.12)

$y = 0.3683 \times 16.4^{1.528}$

$y = 26.06\ \%$

Based on survey conducted by author there are condition that should be nocited. First condition is when harbour tug approaching the ship to operate pull/tow condition, fuel rack position is relatively constant on 8 mm to 9 mm (around 12 % - 14%) based on engine shop test and almost never reach more than 90% load. Second condition when tug operating pull/push operation on tug-barge the information (based on daily report) is incomplete about the name and dimension of barge, it is impact to engine load is just around 1% (which is impossible), so based on this condition when the result of Engine Load (EL) is around 1% to 15% and exceed 90% , an assumption is needed when the result comes into 1% to 15%, engine load was normalized to 25% and if engine load exceed 90%, it is normalized to 90%.

This assumption taken in this thesis is from typical engine load condition of harbour tug (Adnanes,2012) as can be seen on table below :

Table 4.25 Typical Harbour Tug Operating Modes
(Source: ABB Singapore)

OPERATING MODES	Assist Low	Assist High
Power Demand (%)	25	90

Here the results of KT. BIMA 333 and KT. Kresna 315 on 1-October-2017 :

Table 4.26 Engine load KT. BIMA 333

DATE	NO	SHIP NAME	BOLLARD PULL REQUIRED (Ton)	ENGINE LOAD ESTIMATE (%)	ENGINE LOAD SELECTED (%)
Sunday, 01 October 2017	1	UNI FORTUNA	32.72	76.00	76.00
	2	CURUG MAS	9.01	10.59	25
	3	MITRA PROGRES 3	11.18	14.74	25
	4	CAPE FULMAR	23.88	46.97	46.97
	5	TELUK BERAU	9.81	12.07	25
	6	NAVIGATOR ARIES	21.70	40.59	40.59
	7	TANTO DAMAI	14.04	20.87	20.87
	8	SINAR BELAWAN	16.24	26.06	26.06
	9	CAPE FULMAR	23.46	45.72	45.72
	10	ORIENTAL DIAMOND	27.21	57.33	57.33
	11	MENTARI SENTOSA	11.74	15.88	25
	12	TANTO RAYA	12.14	16.70	25
	13	BEETHOVEN	37.91	95.18	90
	14	OLYMPIA	42.39	112.88	90

Table 4.27 Engine load KT. KRESNA 315

DATE	NO	SHIP NAME	BOLLARD PULL REQUIRED (Ton)	ENGINE LOAD ESTIMATE (%)	ENGINE LOAD SELECTED (%)
Sunday, 01 October 2017	1	TANTO FAJAR 1	9.69	9.66	25.0
	2	TANTO SEMANGAT	18.11	24.10	24.1
	3	MERATUS MALINO	16.99	21.95	22.0
	4	AWLI	16.32	20.71	20.7
	5	MENTAYA RIVER	10.41	10.74	25.0
	6	RED ROCK	9.45	9.32	25.0
	7	SINAR BELAWAN	15.96	20.04	20.0
	8	KOTA JUTA	26.40	41.79	41.8
	9	SPIL NIKEN	26.46	41.93	41.9
	10	SPIL NITA	26.41	41.81	41.8
	11	PAN DAISY	30.28	51.05	51.1
	12	SEASPAN FRASER	38.72	73.12	73.1
	13	UNI FORTUNA	30.96	52.74	52.7

4.2.4. Calculation Fuel Oil Consumption

To determine Fuel Oil Consumption (FOC) is based on equation (x) for KT. BIMA 333 and equation (x) KT. Kresna 315 from each engine shop test. To estimate Fuel Oil Consumption (FOC) there are 4 parameters to input such as,

4.2.4.1. Typical harbour tug load

Due to unknown load, in order to make the load demand prediction this paper utilizes a typical engine load of harbour tug (Adnanes, 2012) as shown on table 4.28 provided by ABB (Singapore) to estimate engine load of harbour tug.

Table 4.28 Typical Harbour Tug Operating Modes
(Source: Adnanes)

OPERATING MODES	At Quay	Loitering	Slow steam	Full Steam	Assist Low	Assist High
Duration (%)	20	20	25	10	10	15
Power Demand (%)	5	10	10	35	25	90

The table presented that there are 6 modes of typical harbour tug load demand. There are 3 modes (At Quay, Loitering, Slow steam) required a low demand around 10% and account 65% of operating time. Next 2 modes required medium load around 30% (Full Steam, Assist Low) and account 20% of operating time. The last (Assist High) required around 90% and account 15% of operating time.

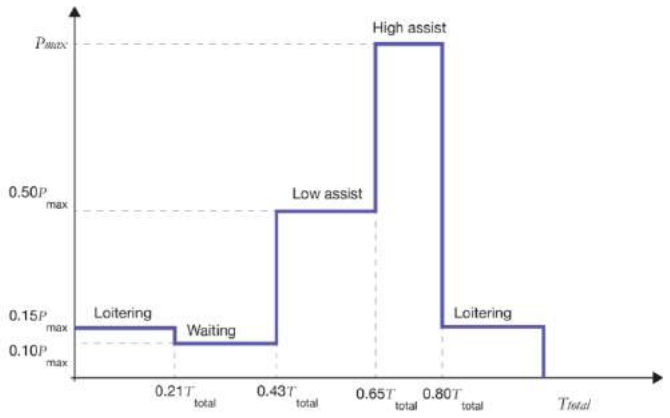


Figure 4.19 Tug load profle
(Source: Adnanes. 2012)

From picture depicted in figure 4.21 (Adnanes, 2012) making an approach based on research developed by ABB Singapore. According to the operational characteristic of typical harbour tug when harbour tug assigned the job to pull or push the ship, harbour tug need to go over the ship it is called loitering/slow steam mode and after harbour tug reach target area, harbour tug need to be wait before starting pull/push operation to the ship during this condition is same with engine load condition at quay in this work called waiting mode, and then tugboat start its task to the ship, in this mode the power demand usually increase at low load to high load. Lastly, after harbour tug ended its task harbour tug have to go back to the station or going to next operation this is also called loitering/slow steam mode.

Based on table 4.28 and typical load profile provided by (Adnanes,2012) depicted on figure 4.21, so this thesis classified engine load harbour tug based on their typical operating condition.

Loitering : 10 % of power demand and 41 % Operation time

Waiting : 5 % of power demand and 22 % Operation time

Assist Low : $\frac{Total\ Engine\ Load\ Selected}{2}$ and 22 % Operation time

Assist High : Total Engine Load Selected and 15 % Operation time

4.2.4.2. Engine Load needed to tow/push particular ship and Operation Time

Based on calculation engine load required from equation (4.21) for KT. Bima 333 and equation (4.23) for Kresna 315

For example Engine Load to tow/push MV. Sinar Belawan already calculated in section 4.4 obtained 26.06 % Power Demand

So for load condition in this paper assumed that :

Loitering : 10 %

Waiting : 5 %

Assist Low : $\frac{26.06\ \%}{2}$ = 13.03 %

Assist High : 26.06 %

4.2.4.3. Operation Time

Based on AIS Trajectory data, the total operation time MV. Sinar Belawan as shown in the table below :

Table 4.29 Sinar Belawan Operation Time

OPERATING TIME		SERVICE TIME		LOITERING	SERVICE	TOTAL
START	END	START	END	minutes	minutes	minutes
11.49	13.12	12.20	12.48	55	28	83

4.2.4.4. Main engine fuel oil consumption

To calculate fuel oil consumption using regression formula (4.1) and (4.3) for KT. Bima 333 and regression formula (4.5) and (4.7) for KT. Kresna 315.

For example KT. BIMA 333 (MV. Sinar Belawan) :

1. Loitering Mode :

Starboard FOC formula

$$y = 2.154x + 6.5461 \qquad (4.1)$$

with x : engine load (%)
y : fuel oil consumption (kg/h)

when in loitering modes tugs assume that run in 10% load for 41% of operating time

y = 2.154 x 10 + 6.5461

y = 28.0861 kg/h

Multiply FOC formula with 41% of actual operating time :

FOC_{sb} = 28.0861 kg/h x $\frac{Total\ Operating\ Time}{60}\ hours$

FOC_{sb} = 28.0861 kg/h x $\frac{83}{60}\ hours$ x 0.41

FOC_{sb} = 10.813 kg

Portside FOC formula using equation (4.3) with same way of calculation the result is :

FOC_{ps} = 10.524 kg

2. Waiting Mode :

Starboard FOC formula

$$y = 2.154x + 6.5461 \qquad (4.1)$$

with x : engine load (%)

y : fuel oil consumption (kg/h)

when in waiting mode tugs assume that run in 5 % load for 22% of operating time

y = 2.154 x 5 + 6.5461

y = 17.316 kg/h

Multiply FOC formula with 22 % of actual operating time :

FOCsb = 17.316 kg/h x $\frac{Total\ Operating\ Time}{60}\ hours$

FOCsb = 17.316 kg/h x $\frac{83}{60}\ hours$ x 0.22

FOCsb = 5.270 kg

Portside FOC formula using equation (4.3) with same way of calculation the result is :

FOC_{ps} = 5.247 kg

3. Low Assist

Starboard FOC formula

$$y = 2.154x + 6.5461 \qquad (4.1)$$

with x : engine load (%)

y : fuel oil consumption (kg/h)

when in low assist modes based on calculation engine load demand tugs run in 13.03 % load for 22% of operating time

y = 2.154 x 13.03 + 6.5461

y = 34.61 kg/h

Multiply FOC formula with 20 % of actual operating time :

FOCsb = 34.61 kg/h x $\frac{Total\ Operating\ Time}{60}\ hours$

FOCsb = 34.61 kg/h x $\frac{83}{60}\ hours$ x 0.22

FOCsb = 10.535 kg

Portside FOC formula using equation (4.3) with same way of calculation the result is :

FOCps = 10.508 kg

4. High Assist

Starboard FOC formula

$$y = 2.154x + 6.5461 \qquad (4.1)$$

with x : engine load (%)

y : fuel oil consumption (kg/h)

when in low assist modes based on calculation engine load demand tugs run in 26.06 % load for 15 % of operating time

y = 2.154 x 26.06 + 6.5461

y = 62.687 kg/h

Multiply FOC formula with 20 % of actual operating time :

FOCsb = 62.687 kg/h x $\frac{Total\ Operating\ Time}{60}\ hours$

FOCsb = 62.687 kg/h x $\frac{83}{60}\ hours$ x 0.15

FOCsb = 13.007 kg

Portside FOC formula using equation (4.3) with same way of calculation the result is :

FOCps = 12.985 kg

5. Total FOC = FOC_{LT} + FOC_{WT} + FOC_{LA} + FOC_{HA}

= (10.813 + 10.524) + (5.270 + 5.247) + (10.535 + 10.508) + (13.007 + 12.985)

= 78.889 kg

Divided with density of Solar to obtain Litre

= 78.889 kg = 78.889 / 0.85 = 92.81 L

Here the results of calculation form KT.Bima 333 and KT. Kresna 315 (For all calculation can be seen on attachment 1) :

Table 4.30 Estimated Main engine Fuel Oil Consumption KT. BIMA 333

Table 4.31

				FOC (BASED ON OPERATING MODES)									
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)		
Sunday, 01 October 2017	1	UNI FORTUNA	CON	10.223	9.950	6.857	6.827	35.005	34.954	48.294	48.241	200.351	235.71
	2	CURUG MAS	CON	1.966	1.914	1.270	1.264	2.455	2.448	3.020	3.014	17.351	20.41
	3	MITRA PROGRES 3	CON	5.112	4.975	2.984	2.971	5.768	5.753	7.097	7.084	41.744	49.11
	4	CAPE FULMAR	CON	8.651	8.419	4.889	4.868	16.132	16.102	20.738	20.710	100.508	118.24
	5	TELUK BERAU	CON	4.325	4.210	1.714	1.707	3.314	3.305	4.077	4.069	26.721	31.44
	6	NAVIGATOR ARIES	LPG	6.684	6.506	3.556	3.540	10.320	10.299	13.156	13.138	67.199	79.06
	7	TANTO DAMAI	GC	2.752	2.679	3.175	3.161	5.321	5.306	6.438	6.426	35.258	41.48
	8	SINAR BELAWAN	CON	10.813	10.524	5.270	5.247	10.535	10.508	13.007	12.985	78.889	92.81
	9	CAPE FULMAR	CON	5.898	5.741	2.603	2.592	8.386	8.371	10.765	10.751	55.107	64.83
	10	ORIENTAL DIAMOND	CON	4.129	4.018	4.952	4.931	19.530	19.497	25.355	25.324	107.736	126.75
	11	MENTARI SENTOSA	GC	6.881	6.697	4.444	4.425	8.591	8.568	10.569	10.551	60.727	71.44
	12	TANTO RAYA	CON	3.539	3.444	1.968	1.960	3.805	3.795	4.681	4.672	27.863	32.78
	13	BEETHOVEN	CON	3.342	3.253	3.429	3.414	20.488	20.461	27.055	27.026	108.467	127.61
	14	OLYMPIA	CON	7.274	7.080	5.079	5.057	30.353	30.312	40.081	40.039	165.276	194.44
TOTAL												1093.1982	1286.1155

Estimated Main engine Fuel Oil Consumption KT. KRESNA 315

				FOC (BASED ON OPERATING MODES)									
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)		
Sunday, 01 October 2017	1	TANTO FAJAR 1	GC	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.40318	107.5331
	2	TANTO SEMANGAT	CON	12.21338	12.37552	3.87156	3.96821	7.652145	7.735191	9.623653	9.66442	67.10408	78.94597
	3	MERATUS MALINO	CON	7.633363	7.734698	2.419725	2.480132	4.423425	4.476621	5.525012	5.552254	40.24523	47.34733
	4	AWLI	CON	15.26673	15.4694	4.83945	4.960263	8.428742	8.53664	10.47988	10.53641	78.51751	92.37354
	5	MENTAYA RIVER	CON	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.84191	64.51989
	6	RED ROCK	GC	12.86767	13.03849	4.078965	4.180793	8.317422	8.403998	10.4874	10.5291	71.90383	84.59274
	7	SINAR BELAWAN	CON	8.287651	8.397672	2.62713	2.692714	4.45403	4.513041	5.523295	5.554582	42.05012	49.47072
	8	KOTA JUTA	CON	9.596228	9.72362	3.04194	3.11788	9.741174	9.793007	12.64613	12.65987	70.31985	82.72924
	9	SPIL NIKEN	CON	22.4639	22.76211	7.120905	7.298673	22.86952	22.99061	29.69388	29.7257	164.9253	194.0298
	10	SPIL NITA	CON	18.75626	19.00526	5.94561	6.094037	19.04522	19.14651	24.72516	24.75198	137.47	161.7295
	11	PAN DAISY	BC	10.9048	11.04957	3.45675	3.543045	13.28715	13.33807	17.39465	17.39938	90.37343	106.3217
	12	SEASPAN FRASER	CON	15.70292	15.91138	4.97772	5.101985	26.7429	26.78885	35.42476	35.39423	166.0447	195.3467
	13	UNI FORTUNA	CON	6.542883	6.629741	2.07405	2.125827	8.214253	8.243936	10.76674	10.76839	55.36582	65.13626
TOTAL												1093.1982	1286.1155

4.2.4.5. Generator fuel oil consumption

To estimate generator fuel oil consumption is used equation (4.9) for KT BIMA 333 and equation (4.11) for KT. KRESNA 315. In this calculation there are 3 modes that should be calculated such as when harbour tug at quay (main engine stopped, generator is active) , when loitering and service mode (main engine and generator are active).

4.1. Generator capacity of KT. BIMA 333

At Quay = 20 Kw

At Service (Pull/Tow Operation and Loitering) = 40 Kw

4.2. Generator capacity of KT. KRESNA 315

At Quay = 20 Kw

At Service (Pull/Tow Operation and Loitering) = 50 Kw

For exampe when KT. BIMA 333 assist MV. Sinar Belawan using equation (4.9) :

$$y = 0.2371x + 1.9385 \qquad (4.9)$$

with x : power demand (Kw)
y : fuel oil consumption (L/h)

From AIS Trajectory data KT. BIMA 333 as shown in table 4.32 :

Table 4.32 Sinar Belawan Operation Time

OPERATING TIME		SERVICE TIME		LOITERING	SERVICE	TOTAL
START	END	START	END	minutes	minutes	minutes
11.49	13.12	12.20	12.48	55	28	83

So the power demand is 40 kw because this ship is at service condition,

y = 0.2371x + 1.9385

y = 0.2371 x 40 + 1.9385 = 11.4225 kg/h

Fuel oil consumption of generator when assisting MV. Sinar Belawan is,

FOCgen = FOCrate (L/h) x time operation (h)

FOCgen = 11.4225 kg/h x $\frac{83}{60}$ $hours$ = = 15.80 L

Here the result of generator fuel oil consumption (For all calculation can be seen on attachment 1) :

Table 4.33 KT BIMA 333 Generator Fuel Oil Consumption

DATE	NO	SHIP NAME	OPERATION TIME				FOC GENERATOR		
			QUAY	TRANSIT	SERVICE	TOTAL	QUAY	SERVICE	TOTAL
			minutes	minutes	minutes	minutes	L	L	L
Sunday, 01 October 2017	1	UNI FORTUNA		52	56	108		20.56	20.56
	2	CURUG MAS	20	10	10	20	2.23	3.81	6.03
	3	MITRA PROGRES 3		26	21	47		8.95	8.95
	4	CAPE FULMAR	47	44	33	77	5.23	14.66	19.89
	5	TELUK BERAU	167	22	5	27	18.59	5.14	23.73
	6	NAVIGATOR ARIES	71	34	22	56	7.91	10.66	18.57
	7	TANTO DAMAI	23	14	36	50	2.56	9.52	12.08
	8	SINAR BELAWAN		55	28	83		15.80	15.80
	9	CAPE FULMAR	28	30	11	41	3.12	7.81	10.92
	10	ORIENTAL DIAMOND		21	57	78		14.85	14.85
	11	MENTARI SENTOSA	56	35	35	70	6.24	13.33	19.56
	12	TANTO RAYA	57	18	13	31	6.35	5.90	12.25
	13	BEETHOVEN	149	17	37	54	16.59	10.28	26.87
	14	OLYMPIA		37	43	80		15.23	15.23
TOTAL									225.2974

Table 4.34 KT KRESNA 315 Generator Fuel Oil Consumption

DATE	NO	SHIP NAME	OPERATION TIME				FOC GENERATOR		
			QUAY	TRANSIT	SERVICE	TOTAL	QUAY	SERVICE	TOTAL
			minutes	minutes	minutes	minutes	L	L	L
Sunday, 01 October 2017	1	TANTO FAJAR 1		40	35	75	0.0	15.5	15.5
	2	TANTO SEMANGAT	118	32	24	56	9.7	11.5	21.3
	3	MERATUS MALINO		5	30	35	0.0	7.2	7.2
	4	AWLI	194	35	35	70	16.0	14.4	30.4
	5	MENTAYA RIVER	33	34	11	45	2.7	9.3	12.0
	6	RED ROCK		16	43	59	0.0	12.2	12.2
	7	SINAR BELAWAN		14	24	38	0.0	7.8	7.8
	8	KOTA JUTA		31	13	44	0.0	9.1	9.1
	9	SPIL NIKEN		63	40	103	0.0	21.2	21.2
	10	SPIL NITA	85	45	41	86	7.0	17.7	24.7
	11	PAN DAISY	52	12	38	50	4.3	10.3	14.6
	12	SEASPAN FRASER	67	40	32	72	5.5	14.8	20.4
	13	UNI FORTUNA		20	10	30	0.0	6.2	6.2
	14			40	35	75	0.0	15.5	15.5
TOTAL									202.5

4.3. Company Estimation

The company has a method to calculate fuel needs using this formula,

Company Estimated = 0.03 x Total Horse Power x Working Hour

Based on interview with employee, the company making an assumption that working hour is 90% total time operation.

4.4. Result of Calculation

As a introduction, based on (Hensen, 2003) there are many factor and uncertainty to estimate bollard pull which is affected to fuel consumption on harbour tug such as :

1. Port Particular for example restriction in the fairway, port entrance, passage to berth, turning cicle, locks, moored vessel, speed restrictions, available stopping distance, maneuvering space, water depths.
2. Berth construction for example type of berth : open or solid berth
3. Ship for example type, draft, underkeel clereance, trim, availability of side thrusters, propeller type, windage and size of ship
4. Enviromental condition such as wind, current, waves, visibility and ice
5. Method of tug assistance such as towing on a line operating at ship's side or a combination of methods

Specifically on this thesis still have many uncertainty due to lack of information such as mentioned above.

There are 4 conditions to be compared :

1. Fuel Estimation using AIS working hour
2. Fuel Estimation using Daily report working hour
3. Fuel Recorded on daily report (FRD)
4. Fuel Estimation using Company method with Working Hour recorded on AIS ($FE\text{-}CM_{AIS}$)
5. Fuel Estimation using Company method with Working Hour recorded on daily report ($FE\text{-}CM_{DR}$)

The outline of the result are shown in the table below :

Table 4.35 KT BIMA 333 Estimation Result 1

Fuel Estimate (FE)	Working Hour (AIS)	Fuel Estimate(FE)	Working Hour (DR)	Daily Report (DR)	Working Hour (DR)	Company Estimate ($FE\text{-}CM_{AIS}$)	Working Hour (AIS)	Company Estimate ($FE\text{-}CM_{DR}$)	Working Hour (DR)
L	h	L	h	L	h	L	h	L	h
56806	511	67412	648	63390	648	49428	511	62670	648

Table 4.36 KT BIMA 333 Estimation Result 2

MARGIN FE vs DR		MARGIN FE(AIS) VS FE (DR)		MARGIN FE(AIS) vs CE (AIS)		MARGIN DR : CE (DR)		MARGIN DR : CE (DR)	
L	%	L	%	L	%	L	%	L	%
-6584	10.39	-10606	15.73	7378	-14.93	720	-1.15	13962	-28.25

Table 4.37 KT KRESNA 315 Estimation Result 1

Fuel Estimate (FE)	Working Hour (AIS)	Fuel Estimate(FE)	Working Hour (DR)	Daily Report (DR)	Working Hour (DR)	Company Estimate (AIS)	Working Hour (AIS)	Company Estimate (DR)	Working Hour (DR)
L	h	L	h	L	h	L	h	L	h
65900.5164	490.95	76707.2446	575.6	71288	575.6	55968.3	490.95	65618.4	575.6

Table 4.38 KT KRESNA 315 Estimation Result 2

MARGIN FE vs DR		MARGIN FE(AIS) VS FE (DR)		MARGIN FE(AIS) vs CE (AIS)		MARGIN DR vs CE (DR)		MARGIN DR vs CE (AIS)	
L	%	L	%	L	%	L	%	L	%
-5387	7.56	-10806.73	14.09	9932	-17.75	5670	-8.64	15320	-27.37

Both of the result as shown in the table 4.35 and 4.37 are indicate same pattern that fuel oil consumption from fuel estimation using daily report are the largest of all. It's because the working hour is longer than AIS working hour and there uncertainty which is cannot be measure in this method are affect the results and the second largest is fuel consumption recorded on daily report, there are many factors implied this result such as working hour, load that affect the engine, lack of maintenance and environmental condition

Figures 4.20 and 4.21 shown the results of comparison as describe above

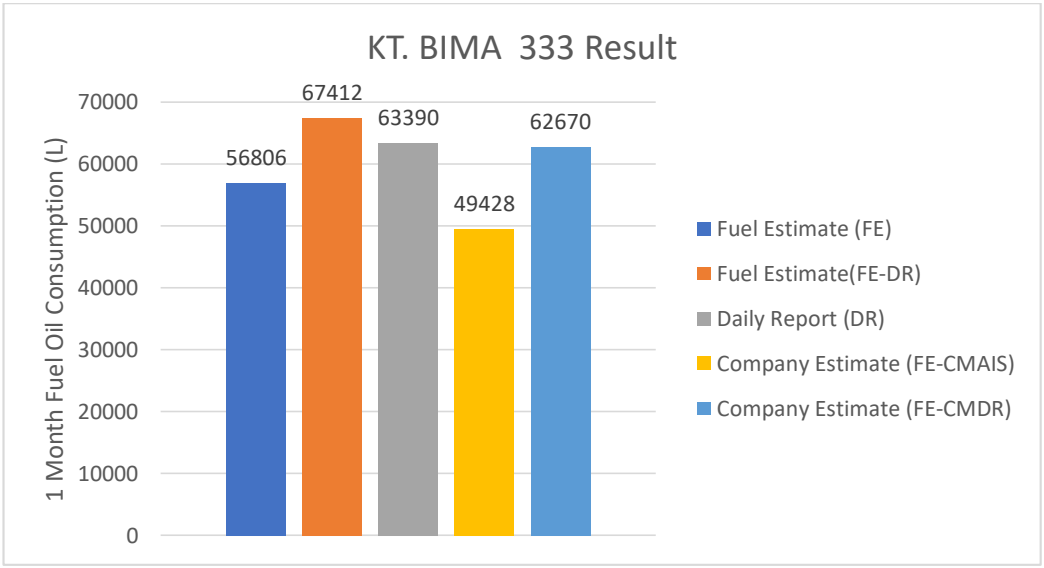


Figure 4.20 KT. BIMA 333 Result

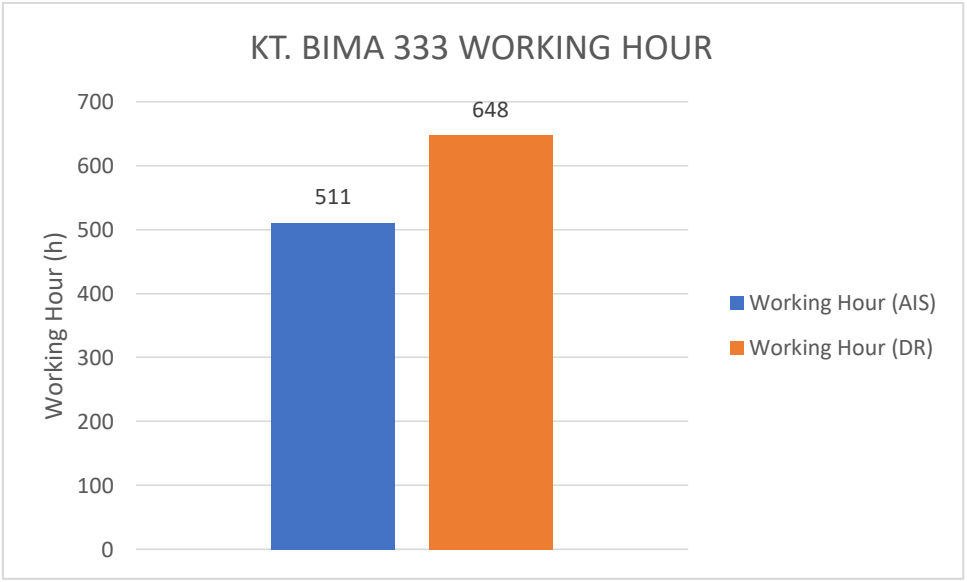


Figure 4.21 KT. BIMA 333 Working hour

Figures 4.22 and 4.23 shown the results of comparison as describe above

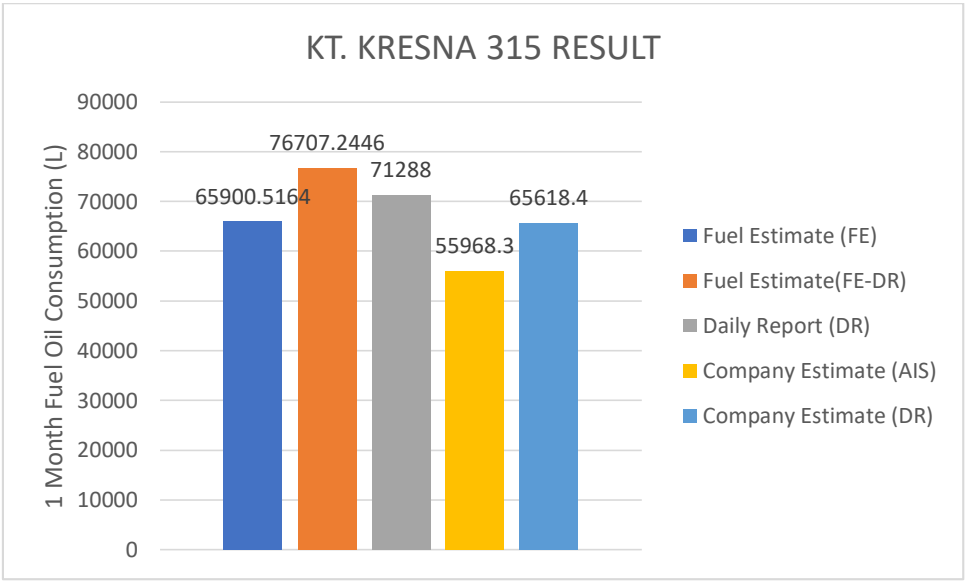


Figure 4.22 KT. KRESNA 315 Result

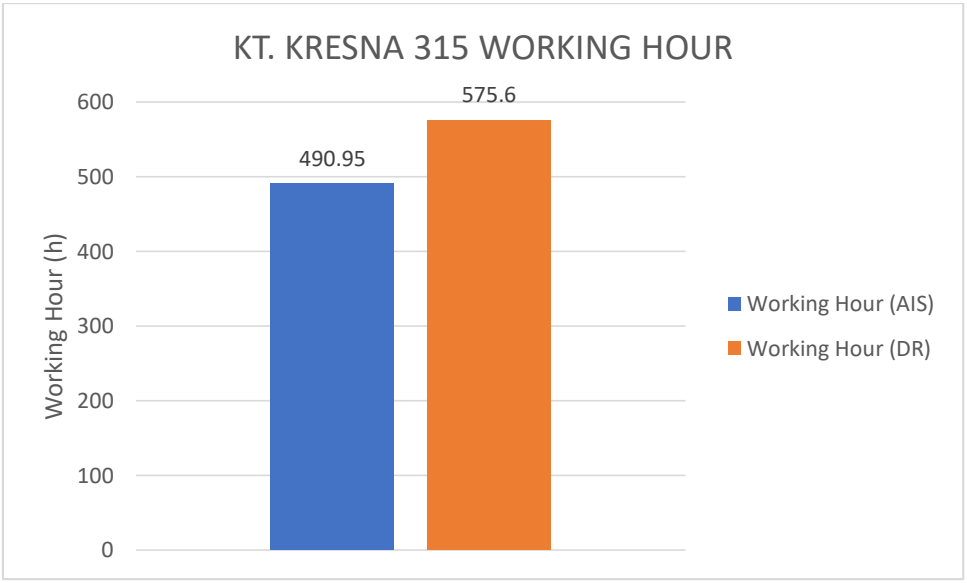


Figure 4.23 KT. KRESNA 315 Working hour

Here the result of fuel oil consumption estimation for both harbour tug :

Table 4.39 KT BIMA 333 Detail Estimation Result 1

Date	Fuel Estimate (FE)	Working Hour (AIS)	Fuel Estimate(FE)	Working Hour (DR)	Daily Report (DR)	Working Hour (DR)	Company Estimate ($FE\text{-}CM_{AIS}$)	Working Hour (AIS)	Company Estimate ($FE\text{-}CM_{DR}$)	Working Hour (DR)
	L	h	L	h	L	h	L	h	L	h
01/10/2017	1645	13.70	2018.9273	19.45	1940	19.45	1324.653	13.70	1880.6205	19.45
02/10/2017	1809	15.60	2487.5746	21.1	2054	21.1	1508.364	15.60	2040.159	21.1
03/10/2017	2087	16.10	2824.6958	23.3	2240	23.3	1556.709	16.10	2252.877	23.3
04/10/2017	1856	15.26	2320.0273	19	1880	19	1475.4894	15.26	1837.11	19
05/10/2017	1775	14.18	2279.6071	18.55	1874	18.55	1371.0642	14.18	1793.5995	18.55
06/10/2017	2012	17.35	2312.7028	19.3	1920	19.3	1677.5715	17.35	1866.117	19.3
07/10/2017	2136	18.78	2442.3066	20.45	2020	20.45	1815.8382	18.78	1977.3105	20.45
08/10/2017	1956	15.16	2561.0827	20	1960	20	1465.8204	15.16	1933.8	20
09/10/2017	1891	14.73	2480.2477	19.3	1920	19.3	1424.2437	14.73	1866.117	19.3
10/10/2017	1671	16.80	1897.3011	22	2120	22	1624.392	16.80	2127.18	22
11/10/2017	1293	15.31	1634.4545	20.45	2020	20.45	1480.3239	15.31	1977.3105	20.45
12/10/2017	1452	14.83	1652.4284	21.15	2060	21.15	1433.9127	14.83	2044.9935	21.15
13/10/2017	1731	17.43	1980.4392	23.5	2266	23.5	1685.3067	17.43	2272.215	23.5
14/10/2017	2093	18.95	2519.9932	22.2	2146	22.2	1832.2755	18.95	2146.518	22.2
15/10/2017	1901	15.48	1808.695	16.2	1666	16.2	1496.7612	15.48	1566.378	16.2
16/10/2017	2324	18.45	2583.4727	22.4	2174	22.4	1783.9305	18.45	2165.856	22.4
17/10/2017	1459	12.96	2043.6086	18.2	1870	18.2	1253.1024	12.96	1759.758	18.2
18/10/2017	2640	20.45	3010.3341	24	2260	24	1977.3105	20.45	2320.56	24
19/10/2017	2461	20.80	2563.1608	23.15	2220	23.15	2011.152	20.80	2238.3735	23.15
20/10/2017	2102	16.35	3065.5614	20.05	1966	20.05	1580.8815	16.35	1938.6345	20.05
21/10/2017	1944	15.23	2607.6101	21	2040	21	1472.5887	15.23	2030.49	21
22/10/2017	1782	14.80	1829.0941	16	1674	16	1431.012	14.80	1547.04	16
23/10/2017	1856	15.80	1988.876	17.35	1766	17.35	1527.702	15.80	1677.5715	17.35
24/10/2017	1603	17.00	1873.3394	23.1	2214	23.1	1643.73	17.00	2233.539	23.1
25/10/2017	1641	13.90	1566.4379	21.5	2106	21.5	1343.991	13.90	2078.835	21.5
26/10/2017	1462	17.10	1620.1016	21.55	2114	21.55	1653.399	17.10	2083.6695	21.55
27/10/2017	1775	20.90	1664.8656	24	2280	24	2020.821	20.90	2320.56	24
28/10/2017	1376	16.03	1740.1964	23.15	2220	23.15	1549.9407	16.03	2238.3735	23.15
29/10/2017	1554	17.18	1853.8985	23.3	2220	23.3	1661.1342	17.18	2252.877	23.3
30/10/2017	1686	18.03	2085.6302	23.45	2220	23.45	1743.3207	18.03	2267.3805	23.45
31/10/2017	1835	16.56	2095.1616	20	1960	20	1601.1864	16.56	1933.8	20
TOTAL	LITRE	HOURS	LITRE	HOURS	LITRE	HOURS	LITRE	HOURS	LITRE	HOURS
	56806	511.2	67412	648.15	63390	648.15	49427.928	511.2	62669.6235	648.15

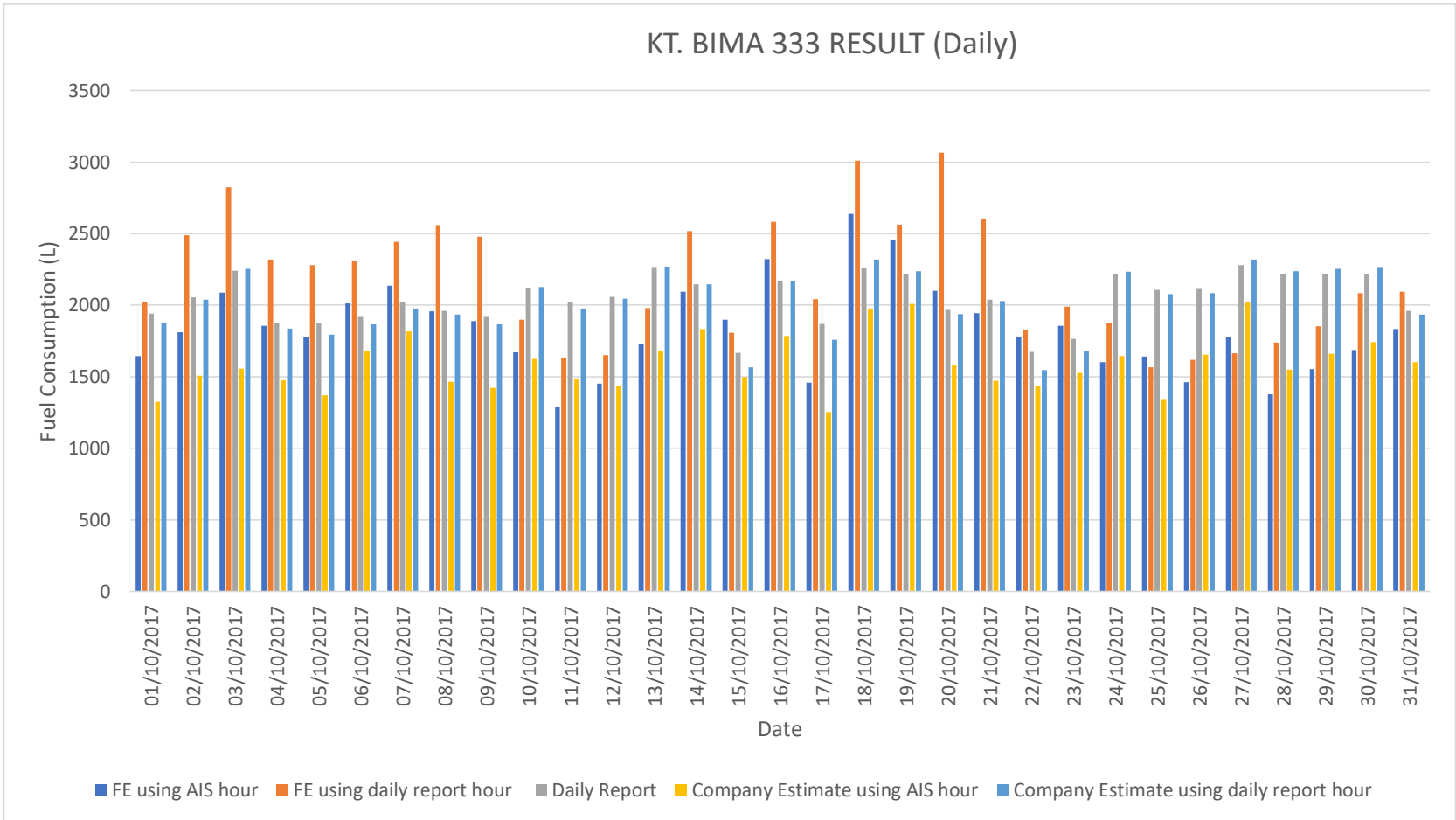


Figure 4.24 KT. BIMA 333 Result Bar Chart

Table 4.40 KT BIMA 333 Detail Estimation Result 2

Date	FE (AIS) vs DR	FE (AIS) vs FE (DR)	FE (AIS) vs CE (AIS)	DR vs CE (DR)	DR vs CE (AIS)
	%	%	%	%	%
01/10/2017	15.21	18.53	-24.18	-3.16	-46.45
02/10/2017	11.92	27.27	-19.95	-0.68	-36.17
03/10/2017	6.81	26.10	-34.09	0.57	-43.89
04/10/2017	1.27	19.99	-25.80	-2.33	-27.42
05/10/2017	5.28	22.14	-29.46	-4.48	-36.68
06/10/2017	-4.79	13.00	-19.94	-2.89	-14.45
07/10/2017	-5.72	12.56	-17.60	-2.16	-11.24
08/10/2017	0.20	23.63	-33.44	-1.35	-33.71
09/10/2017	1.54	23.78	-32.74	-2.89	-34.81
10/10/2017	21.18	11.92	-2.87	0.34	-30.51
11/10/2017	35.99	20.89	12.66	-2.16	-36.46
12/10/2017	29.54	12.16	-1.23	-0.73	-43.66
13/10/2017	23.62	12.61	-2.69	0.27	-34.46
14/10/2017	2.46	16.94	-14.24	0.02	-17.12
15/10/2017	-14.08	-5.08	-26.97	-6.36	-11.31
16/10/2017	-6.90	10.04	-30.27	-0.38	-21.87
17/10/2017	21.98	28.61	-16.43	-6.26	-49.23
18/10/2017	-16.80	12.31	-33.50	2.61	-14.30
19/10/2017	-10.85	3.99	-22.36	0.82	-10.38
20/10/2017	-6.90	31.45	-32.94	-1.41	-24.36
21/10/2017	4.71	25.45	-32.01	-0.47	-38.53
22/10/2017	-6.47	2.56	-24.54	-8.21	-16.98
23/10/2017	-5.10	6.67	-21.50	-5.27	-15.60
24/10/2017	27.58	14.41	2.46	0.87	-34.69
25/10/2017	22.07	-4.77	-22.12	-1.31	-56.70
26/10/2017	30.84	9.76	11.58	-1.46	-27.86
27/10/2017	22.16	-6.60	12.17	1.75	-12.83
28/10/2017	38.03	20.95	11.25	0.82	-43.23
29/10/2017	30.02	16.20	6.48	1.46	-33.64
30/10/2017	24.04	19.15	3.27	2.09	-27.34
31/10/2017	6.37	12.41	-14.61	-1.35	-22.41

TOTAL	MARGIN FE vs DR		MARGIN FE(AIS) VS FE (DR)		MARGIN FE(AIS) vs CE (AIS)		MARGIN DR : CE (DR)		MARGIN DR : CE (DR)	
	L	%	L	%	L	%	L	%	L	%
	-6584.262103	10.39	-10606	15.73	7378	-14.93	720	-1.15	13962	-28.25

Table 4.41 KT KRESNA 315 Detail Estimation Result 1

Date	Fuel Estimate (FE)	Working Hour (AIS)	Fuel Estimate (FE)	Working Hour (DR)	Daily Report (DR)	Working Hour (DR)	Company Estimate (FE-CM_{AIS})	Working Hour (AIS)	Company Estimate (FE-CM_{DR})	Working Hour (DR)
	L	h	L	h	L	h	L	h	L	h
01/10/2017	1533	12.72	2205	19.50	2370	19.50	1449.7	12.72	2223	19.50
02/10/2017	1980	16.12	2191	17.30	2160	17.30	1837.3	16.12	1972.2	17.30
03/10/2017	2853	18.18	2993	19.15	2320	19.15	2072.9	18.18	2183.1	19.15
04/10/2017	3218	19.28	3194	19.10	2300	19.10	2198.3	19.28	2177.4	19.10
05/10/2017	2835	17.00	3033	18.30	2270	18.30	1938	17.00	2086.2	18.30
06/10/2017	2720	19.40	2932	21.20	2508	21.20	2211.6	19.40	2416.8	21.20
07/10/2017	2962	17.18	3172	19.00	2318	19.00	1958.9	17.18	2166	19.00
08/10/2017	2635	17.27	2779	18.20	2200	18.20	1968.4	17.27	2074.8	18.20
09/10/2017	2219	14.98	2497	17.00	2080	17.00	1708.1	14.98	1938	17.00
10/10/2017	1867	16.53	2020	17.15	2148	17.15	1884.8	16.53	1955.1	17.15
11/10/2017	1527	14.38	2170	14.30	1880	14.30	1639.7	14.38	1630.2	14.30
12/10/2017	1331	11.82	1572	14.30	1840	14.30	1347.1	11.82	1630.2	14.30
13/10/2017	1925	16.93	2065	18.20	2240	18.20	1930.4	16.93	2074.8	18.20
14/10/2017	2467	19.15	2606	20.35	2470	20.35	2183.1	19.15	2319.9	20.35
15/10/2017	2004	14.93	2553	21.10	2540	21.10	1702.4	14.93	2405.4	21.10
16/10/2017	2155	14.33	2663	17.40	2170	17.40	1634	14.33	1983.6	17.40
17/10/2017	1943	13.33	2185	15.20	1930	15.20	1520	13.33	1732.8	15.20
18/10/2017	2762	16.78	3008	18.40	2288	18.40	1913.3	16.78	2097.6	18.40
19/10/2017	3666	21.18	4135	23.30	2770	23.30	2414.9	21.18	2656.2	23.30
20/10/2017	2283	13.42	2975	18.00	2170	18.00	1529.5	13.42	2052	18.00
21/10/2017	2027	14.73	2304	17.50	2160	17.50	1679.6	14.73	1995	17.50
22/10/2017	1555	13.60	1943	17.15	2160	17.15	1550.4	13.60	1955.1	17.15
23/10/2017	1370	10.93	1883	15.20	2020	15.20	1246.4	10.93	1732.8	15.20
24/10/2017	2090	18.22	2494	21.30	2650	21.30	2076.7	18.22	2428.2	21.30
25/10/2017	1810	18.13	2175	21.35	2680	21.35	2067.2	18.13	2433.9	21.35
26/10/2017	1529	15.08	1870	19.15	2446	19.15	1719.5	15.08	2183.1	19.15
27/10/2017	1556	15.48	2092	21.05	2630	21.05	1765.1	15.48	2399.7	21.05
28/10/2017	1426	13.92	1786	18.10	2330	18.10	1586.5	13.92	2063.4	18.10
29/10/2017	1750	16.75	2343	21.00	2600	21.00	1909.5	16.75	2394	21.00
30/10/2017	1718	13.83	2167	18.30	2310	18.30	1577	13.83	2086.2	18.30
31/10/2017	2189	15.33	2703	19.05	2330	19.05	1748	15.33	2171.7	19.05
TOTAL	LITRE	HOURS	LITRE	HOURS	LITRE	HOURS	LITRE	HOURS	LITRE	HOURS
	65901	490.95	76707	575.6	71288	575.6	55968.3	490.95	65618.4	575.6

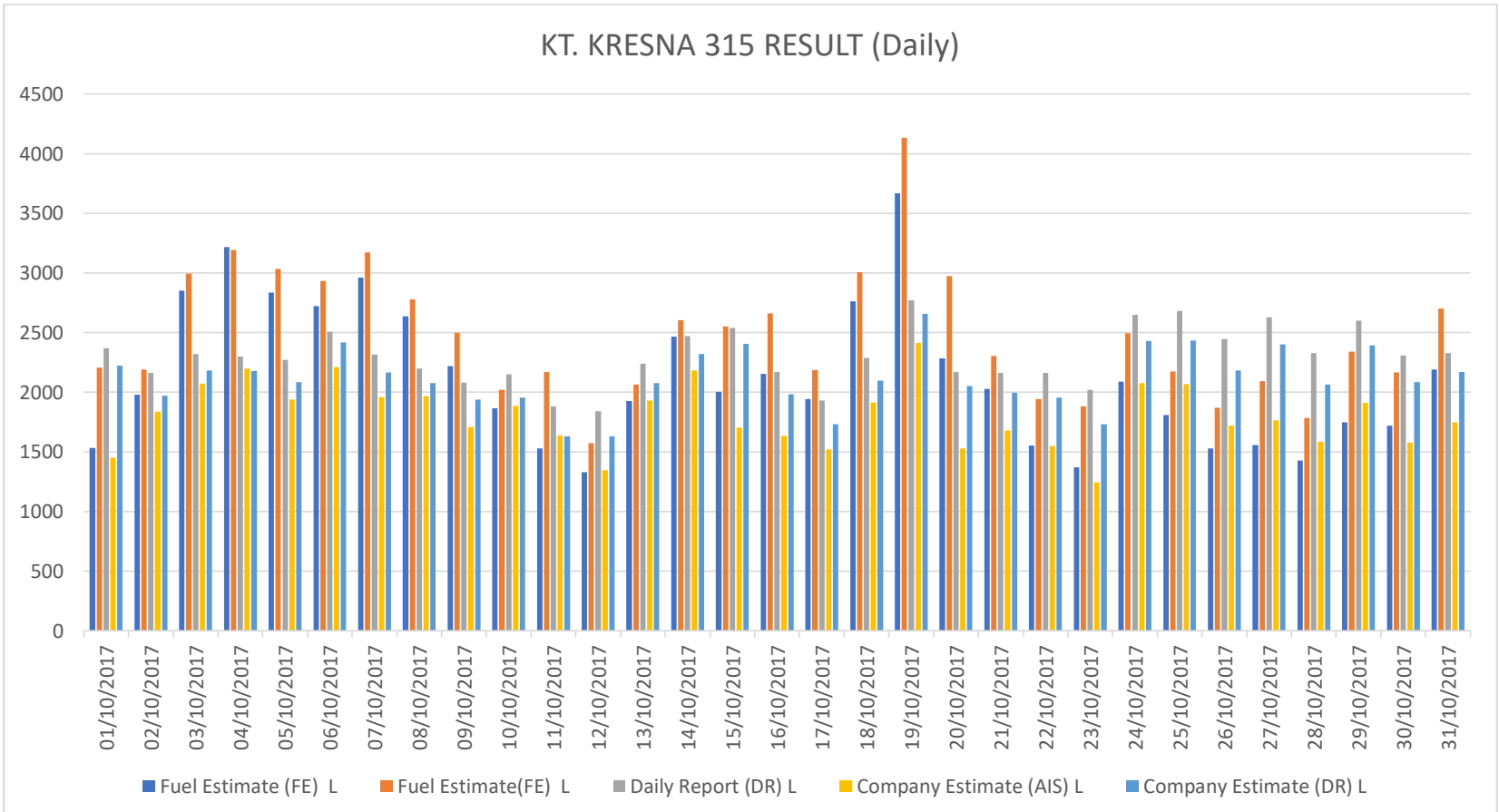


Figure 4.25 KT. KRESNA 315 Result Bar Chart

Table 4.42 KT KRESNA 315 Detail Estimation Result 2

Date	FE (AIS) vs DR	FE (AIS) vs FE (DR)	FE (AIS) vs CE (AIS)	DR vs CE (DR)	DR vs CE (AIS)
	%	%	%	%	%
01/10/2017	35.33	30.50	-5.72	-6.61	-63.48
02/10/2017	8.35	9.66	-7.75	-9.52	-17.56
03/10/2017	-22.98	4.68	-37.64	-6.27	-11.92
04/10/2017	-39.90	-0.76	-46.38	-5.63	-4.63
05/10/2017	-24.88	6.53	-46.27	-8.81	-17.13
06/10/2017	-8.47	7.22	-23.00	-3.77	-13.40
07/10/2017	-27.76	6.64	-51.18	-7.02	-18.33
08/10/2017	-19.77	5.19	-33.86	-6.03	-11.77
09/10/2017	-6.67	11.14	-29.89	-7.33	-21.77
10/10/2017	13.06	7.56	0.92	-9.87	-13.96
11/10/2017	18.78	29.65	6.88	-15.32	-14.66
12/10/2017	27.68	15.35	1.22	-12.87	-36.59
13/10/2017	14.08	6.80	0.30	-7.96	-16.04
14/10/2017	0.14	5.33	-12.99	-6.47	-13.14
15/10/2017	21.09	21.50	-17.73	-5.60	-49.20
16/10/2017	0.69	19.08	-31.88	-9.40	-32.80
17/10/2017	-0.69	11.05	-27.85	-11.38	-26.97
18/10/2017	-20.72	8.17	-44.36	-9.08	-19.58
19/10/2017	-32.35	11.34	-51.81	-4.28	-14.70
20/10/2017	-5.20	23.26	-49.25	-5.75	-41.88
21/10/2017	6.18	12.03	-20.66	-8.27	-28.60
22/10/2017	28.02	19.98	-0.28	-10.48	-39.32
23/10/2017	32.19	27.27	-9.89	-16.57	-62.07
24/10/2017	21.14	16.22	-0.63	-9.13	-27.61
25/10/2017	32.48	16.79	12.47	-10.11	-29.64
26/10/2017	37.51	18.27	11.10	-12.04	-42.25
27/10/2017	40.83	25.61	11.84	-9.60	-49.00
28/10/2017	38.78	20.14	10.09	-12.92	-46.86
29/10/2017	32.71	25.31	8.38	-8.60	-36.16
30/10/2017	25.62	20.72	-8.95	-10.73	-46.48
31/10/2017	6.07	19.02	-25.20	-7.29	-33.30
TOTAL	MARGIN $_{FE\ vs\ DR}$		MARGIN $_{FE(AIS)\ VS\ FE\ (DR)}$		MARGIN $_{FE(AIS)\ vs\ CE\ (AIS)}$		MARGIN $_{DR\ vs\ CE\ (DR)}$		MARGIN $_{DR\ vs\ CE\ (AIS)}$	
	L	%	L	%	L	%	L	%	L	%
	- 5387	7.56	- 10806.73	14.09	9932	-17.75	5670	-8.64	15320	-27.37

4.5. Data Validation

To get a valid estimation regarding time, fuel, and enviromental condition, in this thesis is conducting a survey to measure engine load of this harbour tug by observing and record fuel rack position using camera and record operating time of harbour tug as shown in figure 4.26.

Figure 4.26 Survey on board June 23rd 2018

In this survey are get various information such as there is a difference in recording time by author and tugboat's crew and the crew is set up the engines governor at 10 mm, also the information about generator capacity when harbour tug at berth and pull/ push operation (service) can be obtained by this survey.

Fuel Rack position is used to measure the amount of fuel inject. in this survey fuel rack position is used as parameter to calculate fuel consumption onboard as shown in figure 2.8 , regression formulas is used to calculate the amount of fuel inject to the engine.

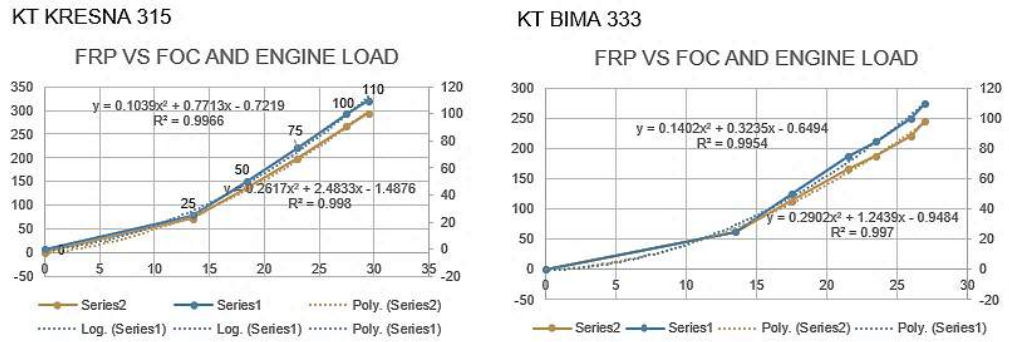


Figure 4.27 Fuel Rack Position vs FOC and Engineload

KT. BIMA 333

Fuel rack position vs engine load formula,

$$y = 0.1402x^2 + 0.3235x - 0.6494 \qquad (4.10)$$

with x : fuel rack position (mm)

y : engine load (%)

Fuel rack position vs fuel oil consumption rate,

$$y = 0.1402x^2 + 0.3235x - 0.6494 \qquad (4.11)$$

with x : fuel rack position (mm)

y : fuel consumption rate (kg/h)

KT. KRESNA 315

Fuel rack position vs engine load formula,

$$y = 0.1039x2 + 0.7713x - 0.7219 \quad (4.10)$$

with x : fuel rack position (mm)

y : engine load (%)

Fuel rack position vs fuel oil consumption rate,

$$y = 0.2617x2 + 2.4833x - 1.4876 \quad (4.11)$$

with x : fuel rack position (mm)

y : fuel consumption rate (kg/h)

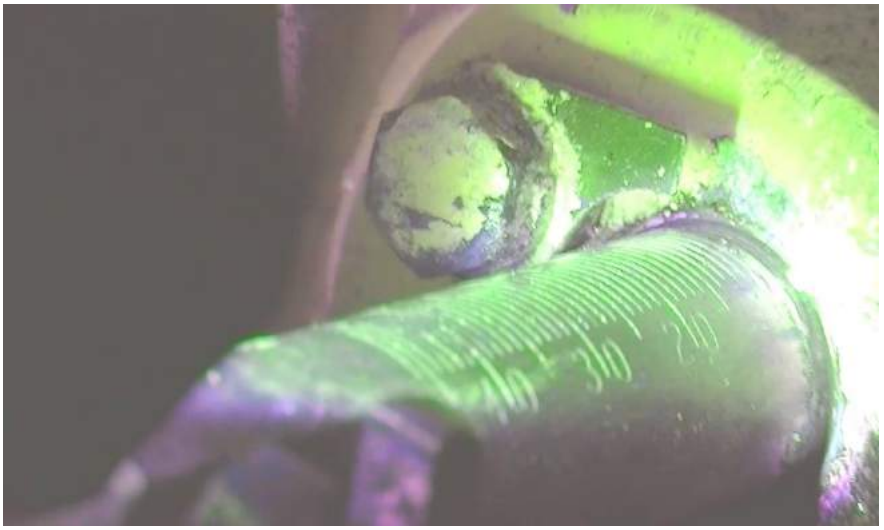


Figure 4.28 Fuel Rack Position onboard survey

Here the result of survey on board :

4.5.1. Survey on 10 June 2018

Name : Simfoni Lestari

Draft : 3.6 m

Table 4.43 Survey Simfoni Lestari

NO	Operating Modes	TIME			FRP (mm)		ENGINE LOAD (%)		FOC (kg/h)		FOC (kg)		TOTAL	
		START	END	TOTAL	ST	PS	SB	PS	ST	PS	ST	PS	kg	L
1	Loitering (Start)	12.05	12.40	35	8	8	12.098	12.795	35.128	37.278	20.491	21.746	42.237	49.690
2	Service (pull push)	12.30	12.47	17	11	11	20.334	21.192	57.494	60.081	16.290	17.023	33.313	39.192
3	Loitering (End)	12.47	13.28	41	8	8	12.098	12.795	35.128	37.278	24.004	25.473	49.477	58.209
TOTAL				93									125.027	147.091

Table 4.44 Estimation Simfoni Lestari

SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)
	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)		
SIMFONI LESTARI	20.28	20.28	6.43	6.43	11.75	11.89	14.67	14.75	106.48	125.271

4.5.2. Survey on 23 June 2018

Name : Dina Ocean

Draft : 9.4 m

Table 4.45 Survey Dina Ocean

NO	Operating Modes	TIME			FRP (mm)		ENGINE LOAD (%)		FOC (kg/h)		FOC (kg)		TOTAL	
		START	END	TOTAL	ST	PS	SB	PS	ST	PS	ST	PS	kg	L
1	Loitering (Start)	12.23	12.57	34	8	8	12.09	12.794	35.127	37.278	19.905	21.124	41.029	48.270
2	Service (pull push)	12.57	13.51	54	13	13	26.864	27.823	75.022	77.858	67.520	70.072	137.592	161.873
3	Loitering (End)	13.51	14.14	23	8	8	12.098	12.794	35.127	37.278	13.465	14.289	27.755	32.653
TOTAL				93									125.027	147.091

Table 4.46 Estimation Dina Ocean

SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)
	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)		
SIMFONI LESTARI	24.21	24.21	7.67	7.67	38.26	38.34	50.56	50.53	241.44	284.0483

4.5.3. Survey on 23 June 2018

Name : Sinar Sejati

Draft : 3.2 m

Table 4.47 Survey Sinar Sejati

NO	Operating Modes	TIME			FRP (mm)		ENGINE LOAD (%)		FOC (kg/h)		FOC (kg)		TOTAL	
		START	END	TOTAL	ST	PS	SB	PS	ST	PS	ST	PS	kg	L
1	Loitering (Start)	14.14	14.49	35	8	8	12.0981	12.7945	35.1276	37.2782	20.4911	21.7456	42.23672	49.690255
2	Service (pull push)	14.49	14.57	8	10	10	17.3811	18.1863	49.5154	51.9646	6.602053	6.92861	13.53067	15.918431
3	Loitering (End)	14.57	15.20	23	8	8	12.0981	12.7945	35.1276	37.2782	13.46558	14.29	27.75556	32.653596
TOTAL				66									83.52294	98.262282

Table 4.48 Estimation Sinar Sejati

SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)
	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)		
SINAR SEJATI	14.39	14.39	4.56	4.56	9.30	9.40	11.73	11.78	80.13	94.27035

4.5.4. Survey on 23 March 2018

Name : Navigator Aries

Draft : 6.4 m

Table 4.49 Survey Navigator Aries

NO	Operating Modes	TIME			FRP (mm)		ENGINE LOAD (%)		FOC (kg/h)		FOC (kg)		TOTAL	
		START	END	TOTAL	ST	PS	SB	PS	ST	PS	ST	PS	kg	L
1	Loitering (Start)	14.23	14.38	15	9	9	13.618	13.618	33.753	33.6855	8.4382	8.421	16.86	19.835
2	Service (pull push)	14.42	14.58	16	12	12	23.421	23.421	55.767	55.6782	14.871	14.85	29.72	34.963
3	Loitering (End)	14.58	15.11	18	9	9	13.618	13.618	33.753	33.6855	10.126	10.11	20.23	23.802
TOTAL				49									66.81	78.6

Table 4.50 Estimation Navigator Aries

SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)
	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)		
NAVIGATOR ARIES	9.40	9.38	3.11	3.10	16.08	16.08	21.13	21.11	99.39	116.9326

4.5.5. Margin

In this section, author compared result of survey with estimation developed by author and company using its method, can be seen in the table below :

Table 4.51 Margin

SHIP NAME	SURVEY (SU)	ESTIMATION (FE)	COMPANY (CE)	MARGIN SU vs FE		MARGIN SU vs CE		MARGIN FE vs CE	
	L	L	L	L	%	L	%	L	%
SIMFONI LESTARI	147.1	125.27	176.7	-21.82	14.834	29.61	-20.130	51.43	29.105
DINA OCEAN	221.1	284.05	210.9	62.97	-28.480	-10.18	4.605	-73.15	-34.683
SINAR SEJATI	98.3	94.27	125.4	-3.99	4.062	27.14	-27.617	31.13	24.824
NAVIGATOR ARIES	70.6	116.93	78.89	46.32	-65.603	8.28	-11.726	-38.04	-48.222

As summary the table 4.51 and figure 4.29, the company estimation relatively bigger than survey and fuel oil estimation by author. The author suspected that differences between fuel estimation is because of uncertainty data (environmental condition), engine governor setting, maintenance of generator and engine, engine life time.

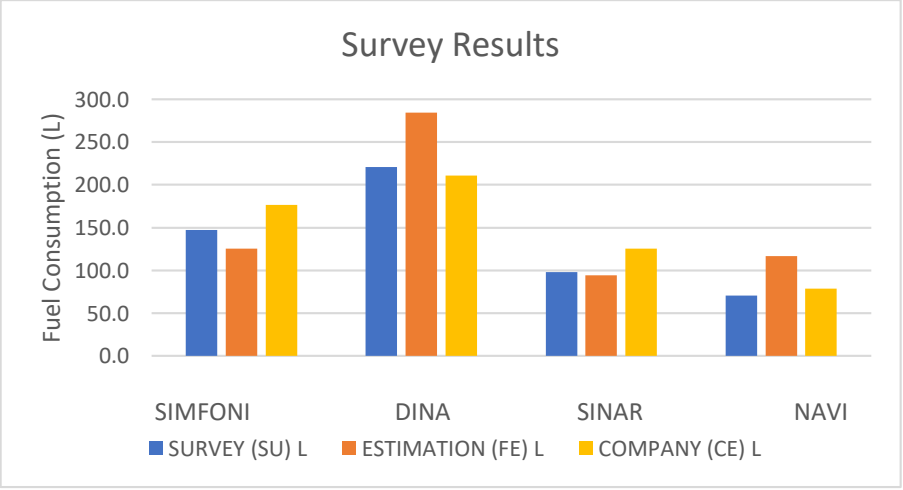


Figure 4.29 Survey Results

4.6. Design an interface of software

As an addition, In this thesis design an interface of software that can be applied in the future by company as a tools to analyze their fleets more accurately in term of harbour tug operation time. There are several feature that proposed by author (can be seen on attachment 2) :

1. Login

Superintendent and crew are given a user name and password to open this website safely

Figure 4.30 Login Page

2. Crew Input Data

Daily report on the company still manually record and there is inaccurate operation time due to not directly record the time. This feature when harbour tug started its operation of pull/tow, crew on board just click "ikat tali" when it finish just click "lepas tali" . The system automatically record the time.

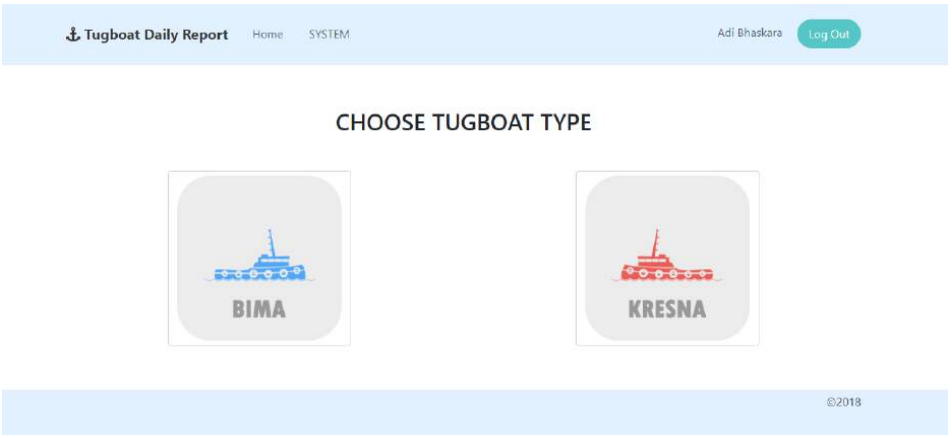


Figure 4.31 Tugboat Selection

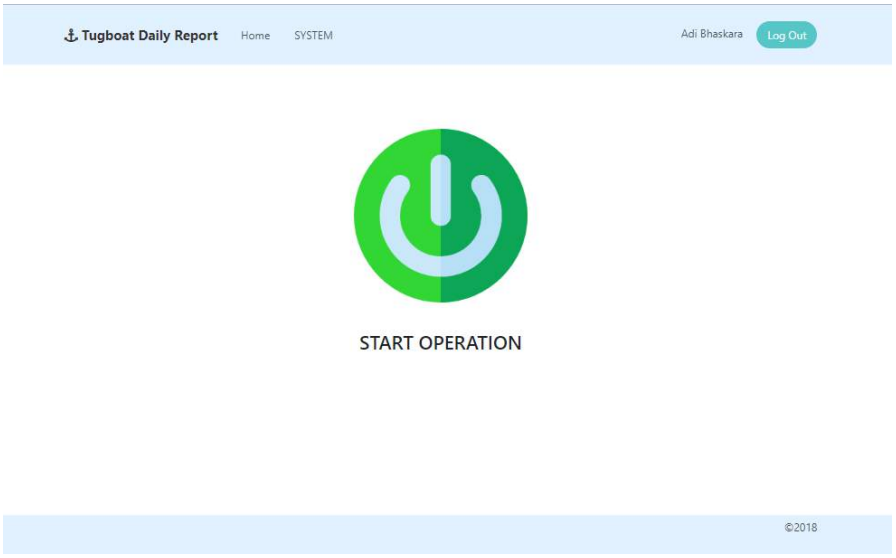


Figure 4.32 Start Operation

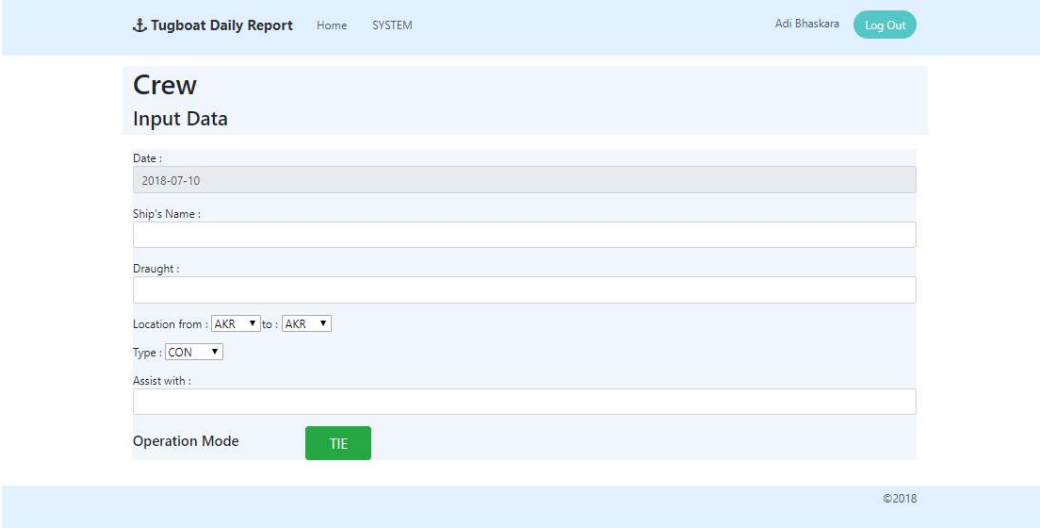


Figure 4.33 Crew Input Data

3. Next or Stop Operation

After the harbour tug is finish do their job, the crew can select next operation when harbour tug perform new assignment or when harbour tug reach its station and stopping the engine, the crew can select engine stop.

Figure 4.34 Next or Stop Operation

4. Superintendent Input Data

This input data is to perform a calculation using fuel estimation method to the each ship which is pushed or pulled by harbour tug.

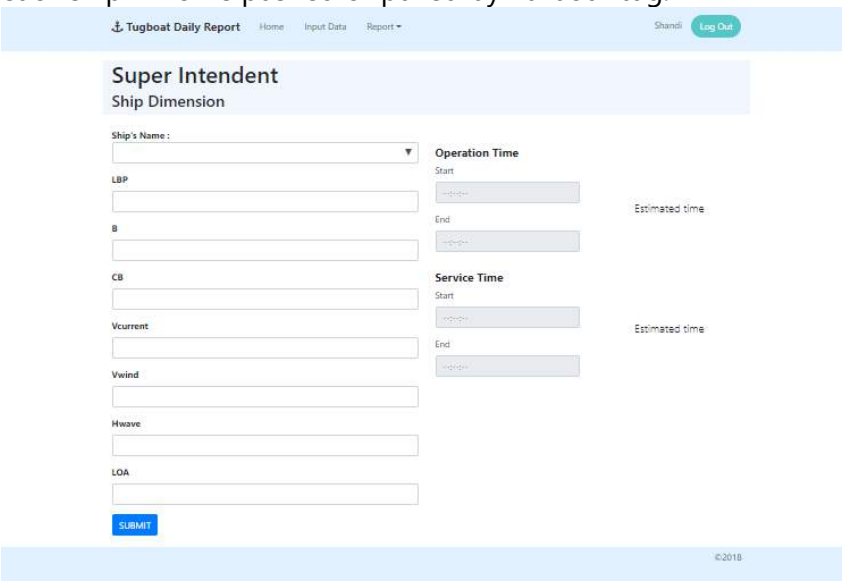


Figure 4.35 Superintendent

5. Report

After a superintendent input ship principal dimension and wheater condition, the system automatically calculated estimate fuel consumption in each ship and show it service time. This report just can be seen by superintendent. There are several feature such as daily operational report , fuel estimated report and print.

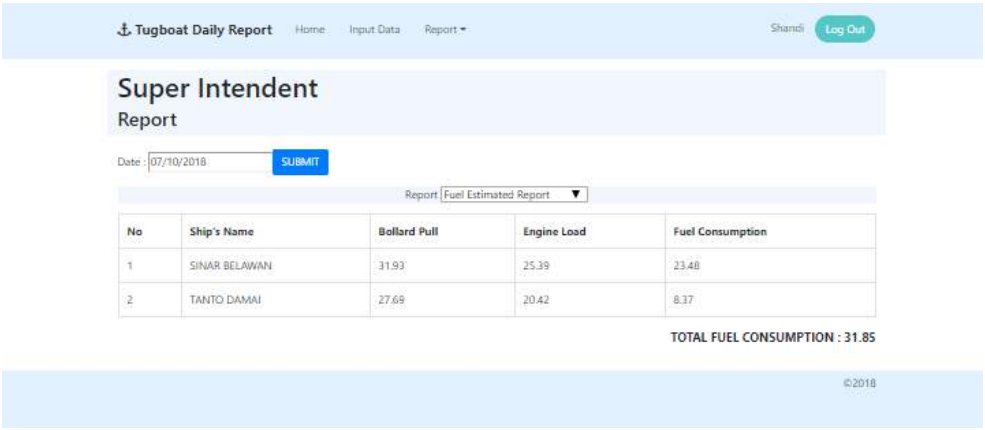


Figure 4.36 Report 1

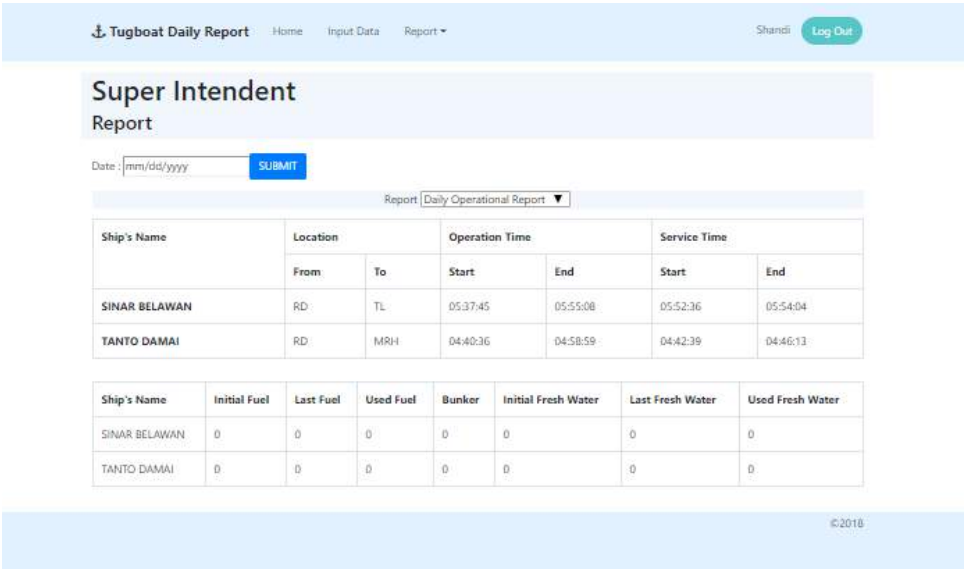


Figure 4.37 Report 2

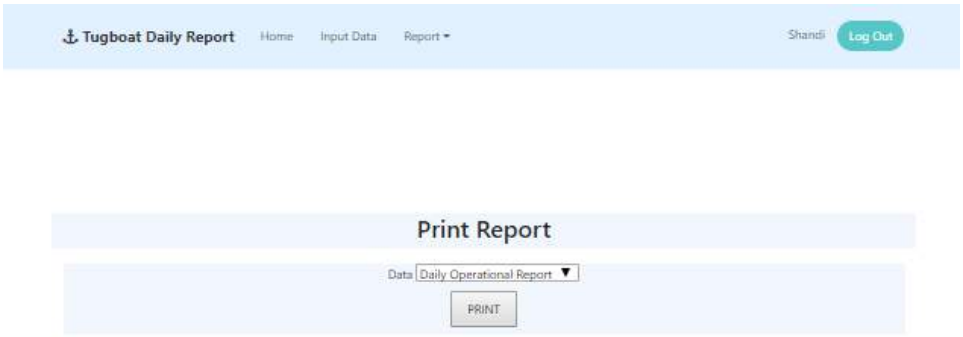


Figure 4.38 Print page

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CHAPTER 5
CONCLUSION

5.1. Conclusion

AIS Data contain position (in term of latitude and longtitude) , time and speed that are ploted to ArcGIS to see ship trajectory in one month and verified by daily report form the company.

The steps to calculated fuel oil consumption are, Firstly using regression on bollard pull vs engine load, engine load vs fuel oil consumption based on bollard pull test and engine shop test to obtain regression formula of fuel oil consumption. Secondly, calculate bollard pull required and input to regression formula to obtain engine load (%) and fuel oil consumption rate (kg/h) in each ship that already done by harbour tug based on daily report. Thirdly, Harbour tug has unique operation mode than any tugboat there are several mode such as loitering, waiting, low assit and high assist. Due to the lack of engine load data and typical time operation of harbour tug, to determine fuel oil consumption and time operating on harbour tug using a typical harbour tug load demand provided by ABB in this step obtain fuel consumption rate and typical time operation in each mode. Fourthly, multiply fuel consumption rate to the total time and a coefficient provided by ABB. Fifthly, calculate fuel oil consumption using regression formula form generator data sheet and inpute generator load (%) to obtain fuel consumption rate (L/h) and then multiply to the operating time in each ship.

There are several calculation are to be compared, such as fuel estimation using working hour recorded on AIS and daily record, company estimation using working hour obtained from AIS data, company estimation using working hour obtained from daily report and fuel consumption record from daily report.

For KT. BIMA 333. Firstly, The result of fuel estimation (using AIS) compare to fuel oil recorded on daily report is 10.39 % or 6584 L it's less than fuel oil recorded, because there is difference in time recording of operation time which is affected to working hour of engine. Secondly, The comparison between fuel estimation using AIS working hour and fuel estimation using working hour from daily report is 15.73% or 10606 L it's larger than fuel estimation using AIS working hour, because there is difference in time operation. Thirdly,The result of fuel estimation using AIS compare to company estimation using working hour obtained from AIS data is 14.95 % or 7378 L it's larger than company estimation, because in fuel

estimation, there are ship that require 90% engine load compared to the fact the harbour tug almost never reach 90% load. Fourthly, the result of fuel oil recorded on daily report compare to company estimation using working hour obtained from daily report is 1.15 % or 730 L it's larger than company estimation, in this case are suspected that there are lack of maintenance of engine, human eror while perform sounding that affect to fuel oil consumption recording on daily record and lastly, the comparison between daily report and company estimation using AIS working hour is 28.25 % or 13962 L , daily report is larger than company estimation using AIS. The cause due to difference in time operation.

For KT. KRESNA 315. Firstly, The result of fuel estimation (using AIS) compare to fuel oil recorded on daily report is 7.56 % or 5387 L it's less than fuel oil recorded, because there is difference in time recording of operation time which is affected to working hour of engine. Secondly, The result of comparison between fuel estimation (using AIS) and fuel estimation (using Daily record) is 14.09 % or 10806.73 L it's larger than fuel estimation using AIS, because there is difference in operating time. Thirdly, The result of fuel estimation compare (using AIS) to company estimation using working hour obtained from AIS data is 17.75 % or 9932 L it's larger than company estimation, because in fuel estimation, there are ship that require 90% engine load compared to the fact the harbour tug almost never reach 90% load. Fourthly, The result of fuel oil recorded on daily report compare to company estimation using working hour obtained from daily report is 8.64 % or 5670 L, it's larger than company estimation, in this case are suspected that there lack of maintenance of engine, human eror while perform sounding that affect to fuel oil consumption recording on daily record and lastly, the comparison between daily report and company estimation using AIS working hour is 27.37 % or 15320 L , daily report is larger than company estimation using AIS. The cause due to difference in time operation.

Factors that influence this calculation such as confident level of weather forecast (current, wave and wind), confident level of draft obtained from AIS provider, time recording of operational service, port particular, maintenance of engine and engine life time.

5.2. Suggestion

Based on the conclusions of the study, the authors recommend a suggestions as follows:

1. The company shall be regularly review fuel oil consumption on their fleets such as by determine average working hour of harbour tug using digitalized daily report to obtained working hour more accurately.
2. To obtain more accurately fuel oil consumption data, the company should installed flow meter that connected to the company system.

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ATTACHMENT

ATTACHMENT 1

CALCULATION KT. BIMA 333 AND KT. KRESNA 315

ATTACHMENT 1
BOLLARD PULL REQUIRED

KT. BIMA 333

	BOLLARD PULL REQUIRED																	
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Sunday, 01 October 2017	1	UNI FORTUNA	CON	238	226	32	7.9	956.83	1.03	0.08	0.53	56.38	0.40	4.06	0.575	4.92	65.44	OV	32.72
	2	CURUG MAS	CON	105	99	16	5.1	284.80	1.03	0.02	0.529	15.54	0.40	1.77	0.575	0.69	18.02	K.306	9.01
	3	MITRA PROGRES 3	CON	101	96	19	6.5	329.86	1.03	0.03	0.529	19.61	0.40	1.72	0.575	1.01	22.37	OV	11.18
	4	CAPE FULMAR	CON	170	161	25	8.3	599.01	1.03	0.05	0.529	41.95	0.40	2.88	0.575	2.89	47.76	OV	23.88
	5	TELUK BERAU	CON	114	108	16	5.0	300.45	1.03	0.03	0.529	16.93	0.40	1.93	0.575	0.74	19.62	KTJ	9.81
	6	NAVIGATOR ARIES	LPG	160	151	26	7.8	589.02	1.03	0.05	0.529	37.04	0.40	2.70	0.800	3.61	43.41	TI	21.70
	7	TANTO DAMAI	GC	127	119	20	6.5	393.77	1.03	0.03	0.529	24.32	0.40	2.13	0.700	1.60	28.09	FI	14.04
	8	SINAR BELAWAN	CON	146	137	25	6.5	539.99	1.03	0.05	0.529	28.06	0.40	2.46	0.575	1.92	32.48	K.315	16.24
	9	CAPE FULMAR	CON	170	161	25	8.3	599.01	1.03	0.05	0.529	41.11	0.40	2.88	0.575	2.89	46.92	TI	23.46
	10	ORIENTAL DIAMOND	CON	196	187	30	8.0	787.87	1.03	0.07	0.529	47.10	0.40	3.35	0.575	3.89	54.41	TI	27.21
	11	MENTARI SENTOSA	GC	101	94	19	6.9	330.71	1.03	0.03	0.529	20.48	0.40	1.69	0.700	1.28	23.48	KTJ	11.74
	12	TANTO RAYA	CON	121	112	20	6.0	391.19	1.03	0.03	0.529	21.08	0.40	2.00	0.575	1.16	24.28	FI	12.14
	13	BEETHOVEN	CON	209	198	30	10.7	820.74	1.03	0.07	0.529	66.72	0.40	3.55	0.575	5.48	75.82	K.306	37.91
	14	OLYMPIA	CON	215	205	30	11.6	830.19	1.03	0.07	0.529	74.92	0.40	3.68	0.575	6.10	84.77	K.306	42.39
TOTAL																			

	BOLLARD PULL REQUIRED																	
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Monday, 02 October 2017	1	KANG MAY	BC	228.41	217.05	36.50	8.00	839.3	1.03	0.07	0.623	74.14	0.4	3.89	0.75	7.11	85.20	K.315	42.60
	2	GUNTHER SCHULTE	GC	230.91	219.48	32.29	10.00	944.92	1.03	0.08	0.623	93.70	0.4	3.93	0.70	7.42	105.13	K.315	52.57
	3	STRAIT MAS	CON	163.66	152.00	26.00	6.50	603.62	1.03	0.05	0.623	42.18	0.4	2.72	0.58	2.21	47.16	K.315	23.58
	4	LEAP HEART	BC	169.37	160.40	27.20	5.6	605.4	1.03	0.05	0.623	38.35	0.4	2.87	0.75	2.74	44.01	OV	22.01
	5	MERATUS GORONTALO	CON	161.85	151.13	25.60	8.1	590.17	1.03	0.05	0.623	52.26	0.4	2.71	0.58	2.69	57.72	K.315	28.86
	6	LIDYA	CON	215.50	205.30	29.80	10.4	830.76	1.03	0.07	0.623	91.16	0.4	3.68	0.58	5.47	100.38	OV	50.19
	7	TELUK FLAMINGGO	CON	114.30	107.60	16.00	5.6	300.45	1.03	0.03	0.623	25.73	0.4	1.93	0.58	0.83	28.51	DINI	14.25
	8	FLORES SEA	GC	128.50	121.32	19.00	5.2	381.04	1.03	0.03	0.623	26.93	0.4	2.17	0.70	1.25	30.39	FI	15.20
	9	MERATUS MEDAN I	CON	161.85	150.00	25.60	6.7	590.17	1.03	0.05	0.623	42.91	0.4	2.69	0.58	2.21	47.86	FI	23.93
	10	HONGKONG BRIDGE	CON	259.80	244.80	32.30	8.0	1029.12	1.03	0.09	0.623	83.61	0.4	4.39	0.58	5.44	93.52	OV	46.76
	11	BONNY STAR	CON	107.20	98.00	17.20	6.9	312.00	1.03	0.03	0.623	28.87	0.4	1.76	0.58	1.00	31.65	RU	15.83
	12																		
	13																		
	14																		
	15																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED															
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Tuesday, 03 October 2017	1	TANTO DAMAI	CON	126.60	117.10	20.00	6.5	397.68	1.03	0.03	0.697	55.41	0.6	4.72	0.58	1.31	61.47	A.14	30.74
	2	OLYMPIA	CON	171.00	161.55	27.46	9.1	655.64	1.03	0.06	0.697	78.48	0.6	6.51	0.58	3.47	88.52	K.315	44.26
	3	FATIMA III	GC	101.10	93.60	19.20	6.7	337.75	1.03	0.03	0.697	33.48	0.6	3.77	0.700	1.26	38.54	RU.2	19.27
	4	MERATUS BENOA	GC	106.68	99.10	20.60	4.6	372.71	1.03	0.03	0.697	24.34	0.6	4.00	0.700	0.98	29.35	RU	14.67
	5	MERATUS KARIMATA	CON	119.90	115.00	21.80	4.5	420.33	1.03	0.04	0.697	27.63	0.6	4.64	0.58	0.97	33.27	KD	16.63
	6	NIRBITA	OT	165.80	158.00	27.40	8.5	560.41	1.03	0.05	0.697	71.70	0.6	6.37	0.800	4.40	82.51	TI	41.26
	7	MERATUS MEDAN I	CON	161.85	150.00	25.60	6.7	590.17	1.03	0.05	0.697	53.65	0.6	6.05	0.58	2.21	61.96	TI	30.98
	8	LUZON	BC	189.99	182.00	32.26	5.7	719.5	1.03	0.06	0.697	55.38	0.6	7.34	0.75	3.75	66.53	DINI	33.27
	9	NRS V	LCT	70.52	65.45	15.85	3.0	208.8	1.03	0.02	0.697	10.48	0.6	2.64	0.75	0.35	13.49	-	13.49
	10	MUTIARA PERSADA 3	PAS	151.10	138.00	23.00	6.8	514.7	1.03	0.04	0.697	50.10	0.6	5.56	0.68	2.18	57.88	OV	28.94
	11	KOTA NABIL	CON	179.70	167.00	27.60	9.1	680.58	1.03	0.06	0.697	81.13	0.6	6.73	0.58	3.61	91.52	OV	45.76
	12	ISA EXPRESS	BC	185.70	177.00	30.40	11.0	681.3	1.03	0.06	0.697	103.94	0.6	7.14	0.75	6.64	117.77	K.315	58.88
	13	PAC SCHEDAR	GC	179.82	169.40	27.20	7.7	671.01	1.03	0.06	0.697	69.63	0.6	6.83	0.700	3.71	80.23	K.315	40.12
	14	MERATUS BONTANG	GC	106.68	99.10	20.60	4.2	372.71	1.03	0.03	0.697	22.22	0.6	4.00	0.700	0.90	27.14	K.315	13.57
	15	SENDANG MAS	CON	215.10	205.28	29.80	9.5	829.69	1.03	0.07	0.697	104.11	0.6	8.28	0.58	4.99	117.45	K.315	58.73
	16	MILA UTAMA	RO	134.90	126.00	20.00	4.5	388.8	1.03	0.03	0.697	30.27	0.6	5.08	0.58	0.97	36.36	K.306	18.18
	17																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED															
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Wednesday, 04 October 2017	1	SPIL CAYA	CON	231.00	214.20	32.20	8.6	942.54	1.03	0.08	0.77	119.99	0.5	6.00	0.58	5.10	131.17		65.58
	2	DOBONSOLO	PAS	146.50	130.00	23.70	5.6	522.2	1.03	0.04	0.77	47.42	0.5	3.64	0.68	1.74	52.85		26.42
	3	TB. AS PERFECT 2	TUG	21.95	20.44	6.10	2.2	26.0	1.03	0.00	0.77	2.86	0.5	0.57	0.50	0.02	3.46	-	3.46
	4	TANTO SENANG	CON	140.00	132.00	20.50	5.6	432.32	1.03	0.04	0.77	48.15	0.5	3.70	0.58	1.30	53.19		26.59
	5	GIOVANNI BOTTIGUER	BC	229.20	222.00	38.00	7.2	867.1	1.03	0.07	0.77	104.12	0.5	6.22	0.75	6.81	117.22		58.61
	6	PRATAMA I	TUG	18.75	18.75	5.25	2.3	18.7	1.03	0.00	0.77	2.81	0.5	0.53	0.50	0.02	3.35	-	3.35
	7	MUARA MAS	CON	107.80	105.60	18.00	4.2	327.48	1.03	0.03	0.77	28.89	0.5	2.96	0.58	0.69	32.56		16.28
	8	BONNY STAR	CON	107.20	98.00	17.20	5.0	312.00	1.03	0.03	0.77	31.92	0.5	2.74	0.58	0.72	35.41		17.71
	9	SINAR AMBON	GC	97.20	90.00	15.60	4.8	268.95	1.03	0.02	0.77	28.14	0.5	2.52	0.700	0.71	31.39	-	31.39
	10	WARNOW CHIEF	CON	180.36	169.25	25.00	9.2	617.95	1.03	0.05	0.77	101.43	0.5	4.74	0.58	3.35	109.56		54.78
	11	MUTIARA PERSADA 3	PAS	151.10	138.00	23.00	6.7	514.7	1.03	0.04	0.77	60.23	0.5	3.86	0.68	2.15	66.28		33.14
	12	DONGGALA VIII	GC	77.11	66.00	11.50	4.0	177.49	1.03	0.02	0.77	17.20	0.5	1.85	0.70	0.32	19.38	-	19.38
	13	TEAM OSCO	OT	129.00	121.19	20.40	7.7	358.91	1.03	0.03	0.77	60.78	0.5	3.39	0.80	2.28	66.48		33.24
	14	MERATUS MEDAN I	CON	161.85	150.00	25.60	5.2	590.17	1.03	0.05	0.77	50.81	0.5	4.20	0.58	1.72	56.77		28.39
	15																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Thursday, 05 October 2017	1	GRIYA AMBON	OT	158.00	151.80	27.30	6.8	515.17	1.03	0.04	0.812	74.94	0.5	4.25	0.800	3.37	82.60	K.315	41.30
	2	LOGISTIK NUSANTARA	GC	126.10	113.80	20.00	5.7	396.78	1.03	0.03	0.812	47.09	0.5	3.19	0.700	1.36	51.67	RU	25.83
	3	TENG HONG	GC	110.00	103.01	19.00	7.0	349.43	1.03	0.03	0.812	52.35	0.5	2.88	0.700	1.43	56.69	TB	28.35
	4	BUMI INDONESIA	OT	108.00	102.60	19.20	4.0	259.43	1.03	0.02	0.812	29.79	0.5	2.87	0.800	0.94	33.63	FI	16.82
	5	SENDANG MAS	CON	215.10	205.28	29.80	9.2	829.69	1.03	0.07	0.812	137.11	0.5	5.75	0.58	4.84	147.76	TB	73.88
	6	MERATUS KARIANGAU	CON	119.90	115.00	21.80	4.2	420.33	1.03	0.04	0.812	35.06	0.5	3.22	0.58	0.91	39.23	KT	19.61
	7	MERATUS KUPANG	CON	128.00	120.60	23.00	3.4	460.22	1.03	0.04	0.812	29.77	0.5	3.38	0.58	0.81	33.99	AXIV	17.00
	8	DHARMA KARTIKA IX	RO	155.00	145.00	19.00	6.0	398.5	1.03	0.03	0.812	63.16	0.5	4.06	0.58	1.42	68.67		68.67
	9	WARNOW CHIEF	CON	180.36	169.25	25.00	7.0	617.95	1.03	0.05	0.812	86.01	0.5	4.74	0.58	2.55	93.35	OV	46.67
	10	LOUDS ISLAND	CON	215.13	205.28	29.80	7.9	829.77	1.03	0.07	0.812	117.73	0.5	5.75	0.58	4.15	127.70	OV	63.85
	11	TB SEMPATI	TUG	23.54	22.08	7.30	2.8	128.9	1.03	0.01	0.812	4.49	0.5	0.62	0.50	0.03	5.15		5.15
	12	LEO PRADANA	CON	199.93	188.00	32.20	8.6	852.58	1.03	0.07	0.812	117.38	0.5	5.26	0.58	4.47	127.19	OV	63.59
	13	SERASI I	RO	107.14	100.00	18.30	5.3	293.1	1.03	0.02	0.812	38.48	0.5	2.80	0.58	0.83	42.14	AXIV	21.07
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Friday, 06 October 2017	1	TANTO BERKAT	CON	119.30	110.00	18.00	7.1	346.09	1.03	0.03	0.836	60.04	0.5	3.08	0.58	1.21	64.36	TI	32.18
	2	TANTO SELALU	CON	129.90	127.30	22.80	4.3	460.12	1.03	0.04	0.836	42.08	0.5	3.56	0.58	1.07	46.76	TI	23.38
	3	ORIENTAL EMERALD	CON	159.50	150.00	25.00	6.9	571.06	1.03	0.05	0.836	79.56	0.5	4.20	0.58	2.22	86.04	K.315	43.02
	4	SAMUDRA MAS	CON	96.50	90.80	16.00	4.2	274.84	1.03	0.02	0.836	29.32	0.5	2.54	0.58	0.52	32.41	-	32.41
	5	NAVIGATOR ARIES	LPG	160.00	152.20	25.60	7.9	587.41	1.03	0.05	0.836	92.43	0.5	4.26	0.800	3.68	100.42	TI	50.21
	6	TB SEMPATI	TUG	23.54	22.08	7.30	2.8	128.9	1.03	0.01	0.836	4.75	0.5	0.62	0.50	0.03	5.42	-	5.42
	7	MEGA 07	TUG	28.00	25.00	8.00	2.0	162.7	1.03	0.01	0.836	3.86	0.5	0.70	0.50	0.03	4.61	-	4.61
	8	CSCL KINGSTON	CON	199.93	188.00	32.20	8.5	852.58	1.03	0.07	0.836	122.84	0.5	5.26	0.58	4.42	132.60	TI	66.30
	9	KEDUNG MAS	CON	107.80	105.60	18.00	3.7	327.48	1.03	0.03	0.836	30.04	0.5	2.96	0.58	0.60	33.62	KD	16.81
	10	MERATUS KUPANG	CON	128.00	120.60	23.00	8.1	460.22	1.03	0.04	0.836	75.09	0.5	3.38	0.58	1.93	80.44	KD	40.22
	11	MULTI SPIRIT	GC	91.30	84.00	15.10	4.2	252.32	1.03	0.02	0.836	27.12	0.5	2.35	0.700	0.56	30.05	RU	15.03
	12	SPIL CITRA	CON	231.00	214.20	32.20	8.1	942.54	1.03	0.08	0.836	133.38	0.5	6.00	0.58	4.80	144.26	K.315	72.13
	13	PRATIWI RAYA	GC	96.90	90.80	15.80	4.7	271.97	1.03	0.02	0.836	32.81	0.5	2.54	0.700	0.71	36.08	OV	18.04
	14	SOPHIA	BC	90.87	86.90	15.00	4.1	297.2	1.03	0.03	0.836	27.39	0.5	2.43	0.58	0.46	30.31	-	30.31
	15																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Saturday, 07 October 2017	1	MENTARI KRISTAL	CON	84.60	79.00	15.00	3.4	241.61	1.03	0.02	0.834	20.54	0.5	2.21	0.58	0.35	23.12		23.12
	2	ANGGRAINI EXCELLENT	OT	90.00	84.69	15.00	3.8	184.84	1.03	0.02	0.834	24.61	0.5	2.37	0.800	0.58	27.58		27.58
	3	BBC NEWYORK	GC	132.20	124.56	15.90	7.8	324.16	1.03	0.03	0.834	74.11	0.5	3.49	0.700	1.61	79.24	K.315	39.62
	4	SPIL HANA	CON	119.00	111.61	26.00	3.7	499.21	1.03	0.04	0.834	31.58	0.5	3.13	0.58	0.92	35.67	K.315	17.84
	5	SPRING MAS	CON	183.21	172.00	27.60	7.2	689.29	1.03	0.06	0.834	94.71	0.5	4.82	0.58	2.94	102.52	FI	51.26
	6	TB. ANTASENA	TUG	29.00	28.00	9.60	3.5	63.6	1.03	0.01	0.834	7.50	0.5	0.78	0.54	0.08	8.36		8.36
	7	SINAR SABANG	CON	175.00	165.00	27.40	10.5	664.07	1.03	0.06	0.834	132.50	0.5	4.62	0.58	4.08	141.26	FI	70.63
	8	SINGAPORE PIONER	OT	119.58	112.60	20.80	5.8	312.73	1.03	0.03	0.834	49.95	0.5	3.15	0.800	1.62	54.75	A.14	27.38
	9	KUNIANG	BC	159.90	149.80	24.10	9.6	539.0	1.03	0.05	0.834	109.98	0.5	4.19	0.75	3.89	118.11	K.306	59.05
	10	Ict IRIS MANDIRI	LC	60.76	60.81	15.85	2.5	196.3	1.03	0.02	0.834	11.63	0.5	1.70	0.68	0.24	13.59		13.59
	11	SEASPAN SANTOS	CON	260.10	244.80	32.25	10.6	1028.39	1.03	0.09	0.834	198.46	0.5	6.85	0.58	7.19	212.59	OV	106.29
	12	TB. ANTASENA	TUG	29.00	28.00	9.60	3.5	63.6	1.03	0.01	0.834	7.50	0.5	0.78	0.54	0.08	8.36		8.36
	13	MULTI SPIRIT	GC	91.30	84.00	15.10	4.2	252.32	1.03	0.02	0.834	26.98	0.5	2.35	0.700	0.56	29.91		29.91
	14	INTREPRID SEAHAWK	OT	176.40	168.00	27.40	7.4	623.76	1.03	0.05	0.834	95.08	0.5	4.70	0.800	4.07	103.91	TI	51.95
	15	MENTARI KRISTAL	GC	107.00	96.50	18.20	4.9	329.81	1.03	0.03	0.834	36.16	0.5	2.70	0.700	0.90	39.79	A.14	19.90
	16																		
	17																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Sunday, 08 October 2017	1	KEDUNG MAS	CON	107.80	105.60	18.00	3.7	327.48	1.03	0.03	0.789	26.74	0.5	2.96	0.58	0.60	30.33	KD	15.17
	2	TANTO ABADI	CON	93.50	84.90	17.60	7.6	297.57	1.03	0.03	0.789	44.16	0.5	2.38	0.58	0.98	47.54		47.54
	3	IRIS MANDIRI	LC	60.76	60.81	15.85	2.5	196.3	1.03	0.02	0.789	10.41	0.5	1.70	0.680	0.24	12.37		12.37
	4	SPIL CITRA	CON	231.00	214.20	32.20	8.1	942.54	1.03	0.08	0.789	118.75	0.5	6.00	0.58	4.80	129.63	OV	64.82
	5	ANGGRAINI EXCELLENT	OT	90.00	84.69	15.00	3.8	184.84	1.03	0.02	0.789	22.03	0.5	2.37	0.800	0.58	24.99		24.99
	6	ORIENTAL EMERALD	CON	159.50	150.00	25.00	5.0	571.06	1.03	0.05	0.789	51.33	0.5	4.20	0.58	1.61	57.19	K.315	28.60
	7	OOCL NORFOLK	CON	260.05	244.80	32.25	11.2	1028.25	1.03	0.09	0.789	187.66	0.5	6.85	0.58	7.60	202.20	FI	101.10
	8	MAGELAN	CON	95.90	89.56	15.20	3.8	260.27	1.03	0.02	0.789	23.29	0.5	2.51	0.58	0.44	26.27		26.27
	9	MUTIARA PERSADA 3	PAS	151.10	138.00	23.00	6.7	514.7	1.03	0.04	0.789	63.28	0.5	3.86	0.68	2.15	69.34	KT	34.67
	10	KURAU	OT	105.00	99.00	18.80	3.2	246.28	1.03	0.02	0.789	21.68	0.5	2.77	0.800	0.71	25.19		25.19
	11	ORIENTAL GOLD	CON	161.90	150.00	25.60	5.5	590.29	1.03	0.05	0.789	56.47	0.5	4.20	0.58	1.82	62.53	K.306	31.27
	12	HANTON TRADER 1	BC	199.90	194.50	32.26	7.0	730.8	1.03	0.06	0.789	93.19	0.5	5.45	0.75	4.92	103.62	K.306	51.81
	13	BBC NEWYORK	GC	132.20	124.56	15.90	8.2	324.16	1.03	0.03	0.789	69.91	0.5	3.49	0.700	1.70	75.12	K.306	37.56
	14	TANTO SELALU	CON	129.90	127.30	22.80	4.3	460.12	1.03	0.04	0.789	37.47	0.5	3.56	0.58	1.07	42.14	K.306	21.07
	15																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Monday, 09 October 2017	1	AS COSTANTINA	CON	221.69	209.62	29.80	11.0	847.34	1.03	0.07	0.701	124.61	0.5	5.87	0.58	5.91	136.46	K.306	68.23
	2	INTAN JAYA	GC	80.00	74.44	13.00	4.2	204.02	1.03	0.02	0.701	16.90	0.5	2.08	0.70	0.43	19.42	FI	9.71
	3	LUMOSO SELAMAT	CON	106.80	99.10	20.80	2.9	376.55	1.03	0.03	0.701	15.53	0.5	2.77	0.58	0.51	18.85		18.85
	4	MENTARI PERKASA	GC	84.57	79.00	15.00	5.0	241.57	1.03	0.02	0.701	21.35	0.5	2.21	0.70	0.62	24.20	FI	12.10
	5	GH LESTE	CON	228.62	218.22	32.20	9.3	935.65	1.03	0.08	0.701	109.68	0.5	6.11	0.58	5.62	121.48	OV	60.74
	6	SITU MAS	CON	215.32	205.28	29.80	7.9	830.27	1.03	0.07	0.701	87.64	0.5	5.75	0.58	4.15	97.61	K.315	48.81
	7	MARINA STAR 2	CON	147.50	138.00	22.20	7.0	483.14	1.03	0.04	0.701	52.21	0.5	3.86	0.58	1.84	57.95	K.315	28.98
	8	KAMILA	CON	112.00	105.00	15.70	3.5	291.57	1.03	0.02	0.701	19.86	0.5	2.94	0.58	0.50	23.32	OV	11.66
	9	TOMINI DIGNITY	BC	190.00	183.05	32.26	10.4	719.5	1.03	0.06	0.701	102.88	0.5	5.13	0.75	6.89	114.95	K.315	57.48
	10	NIKI BAROKAH	PAS	91.70	84.00	15.60	5.0	211.7	1.03	0.02	0.701	22.70	0.5	2.35	0.68	0.66	25.73	KDJ	12.86
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Tuesday, 10 October 2017	1	MERATUS SABANG	GC	98.00	92.20	16.50	4.1	285.65	1.03	0.02	0.619	15.96	0.5	2.58	0.700	0.65	19.22		19.22
	2	RED ROVER	GC	104.87	97.60	16.20	5.9	290.46	1.03	0.02	0.619	24.31	0.5	2.73	0.700	0.98	28.04		28.04
	3	MERATUS KENDARI I	GC	120.00	110.80	19.60	5.9	378.09	1.03	0.03	0.619	27.60	0.5	3.10	0.700	1.34	32.07	KTJ	16.04
	4	SPIL HAPSRI	CON	135.70	133.00	22.50	4.4	465.80	1.03	0.04	0.619	24.70	0.5	3.72	0.58	1.13	29.60	OV	14.80
	5	OCEAN SUKSES	BC	199.99	193.00	32.25	8.0	730.8	1.03	0.06	0.619	65.18	0.5	5.40	0.75	5.58	76.22	OV	38.11
	6	AS SHOUMIA	CON	120.00	115.00	15.00	3.2	330.5	1.03	0.03	0.619	15.53	0.5	3.22	0.58	0.47	19.26	TI	19.26
	7	MULIA KARSA I	OT	82.50	77.00	12.00	5.5	156.96	1.03	0.01	0.619	17.88	0.5	2.16	0.800	0.61	20.65		20.65
	8	TIMUR LAUT MAS	OT	83.30	82.50	14.60	6.0	159.84	1.03	0.01	0.619	20.90	0.5	2.31	0.800	0.86	24.08		24.08
	9	HIJAU SEJUK	CON	128.90	120.60	23.00	6.0	462.09	1.03	0.04	0.619	30.55	0.5	3.38	0.58	1.43	35.39	KD	17.70
	10	AYER MAS	GC	95.00	86.00	16.00	3.6	272.68	1.03	0.02	0.619	13.07	0.5	2.41	0.700	0.52	16.02	K.315	8.01
	11	MENTARI SEJAHTERA	GC	84.57	79.00	15.00	4.2	241.57	1.03	0.02	0.619	14.01	0.5	2.21	0.700	0.52	16.76		16.76
	12	TIGER SUMMER	OT	117.60	109.60	19.00	6.0	303.34	1.03	0.03	0.619	27.76	0.5	3.07	0.800	1.49	32.35	K.315	16.17
	13	LAGUN MAS	GC	96.50	90.80	15.80	5.0	271.40	1.03	0.02	0.619	19.16	0.5	2.54	0.700	0.75	22.48	K.315	11.24
	14	MERATUS BENOA	GC	106.68	99.10	20.60	4.0	372.71	1.03	0.03	0.619	16.73	0.5	2.77	0.700	0.85	20.39	A14	10.20
	15																		
TOTAL																			

	BOLLARD PULL REQUIRED																	
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Wednesday, 11 October 2017	1	PULAU HOKI	CON	121.00	114.00	20.80	5.0	403.11	1.03	0.03	0.521	17.01	0.5	3.19	0.58	1.02	21.26	KDJ	10.63
	2	KAMILIA	CON	112.00	105.00	15.70	4.8	291.57	1.03	0.02	0.521	15.04	0.5	2.94	0.58	0.68	18.69	OV	9.34
	3	HS CHOPIN	CON	246.86	232.32	32.20	8.7	988.46	1.03	0.08	0.521	60.32	0.5	6.50	0.58	5.59	72.50	OV	36.25
	4	WARNOW CHIEF	CON	180.36	169.25	25.00	7.7	617.95	1.03	0.05	0.521	38.89	0.5	4.74	0.58	2.80	46.49	K.315	23.24
	5	KGM HOTEL	OT	20.35	18.93	6.60	3.0	10.38	1.03	0.00	0.521	1.69	0.5	0.53	0.80	0.04	2.27	-	2.27
	6	HIJAU SEJUK	CON	128.90	120.60	23.00	5.8	462.09	1.03	0.04	0.521	20.88	0.5	3.38	0.58	1.38	25.67	OV	12.84
	7	LAGUN MAS	GC	96.50	90.80	15.80	5.0	271.40	1.03	0.02	0.521	13.55	0.5	2.54	0.700	0.75	16.87	K.315	8.43
	8	AYER MAS	GC	95.00	86.00	16.00	3.6	272.68	1.03	0.02	0.521	9.24	0.5	2.41	0.700	0.52	12.19	K.315	6.09
	9	HAPPY STAR I	CON	107.00	98.00	17.50	6.0	317.13	1.03	0.03	0.521	17.55	0.5	2.74	0.58	0.88	21.20	OV	10.60
	10	MARINA STAR 2	CON	147.50	138.00	22.20	6.4	483.14	1.03	0.04	0.521	26.36	0.5	3.86	0.58	1.69	31.95	TI	15.97
	11	FRISIA NUERNRBERG	CON	178.00	16.50	27.60	10.8	676.36	1.03	0.06	0.521	5.32	0.5	0.46	0.58	0.42	6.26	FI	3.13
	12	ORIENTAL MUTIARA	GC	176.60	167.00	27.50	5.6	670.45	1.03	0.06	0.521	27.91	0.5	4.68	0.700	2.69	35.33	OV	17.67
	13	PALUNG MAS	CON	107.80	105.60	18.00	3.7	327.48	1.03	0.03	0.521	11.66	0.5	2.96	0.58	0.60	15.25	KDJ	7.62
TOTAL																			

	BOLLARD PULL REQUIRED																	
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Thursday, 12 October 2017	1	RELIANCE	GC	100.63	94.73	17.80	4.8	312.37	1.03	0.03	0.476	11.33	0.5	2.65	0.700	0.85	14.85	KD	7.43
	2	KANAL MAS	CON	119.90	115.00	21.80	4.2	420.33	1.03	0.04	0.476	12.03	0.5	3.22	0.58	0.91	16.19	KD	8.10
	3	AYER MAS	GC	95.00	86.00	16.00	4.5	272.68	1.03	0.02	0.476	9.64	0.5	2.41	0.700	0.65	12.72	K.315	6.36
	4	ATLANTIK STAR 6	OT	74.00	68.00	6.50	2.6	127.78	1.03	0.01	0.476	4.40	0.5	1.90	0.80	0.14	6.46		6.46
	5	FRISIA NORDBERG	CON	178.00	165.00	27.60	9.3	676.36	1.03	0.06	0.476	38.22	0.5	4.62	0.58	3.64	46.54	K.306	23.27
	6	EVER ABLE	CON	165.00	150.00	27.10	7.2	632.43	1.03	0.05	0.476	26.90	0.5	4.20	0.58	2.52	33.67	K.306	16.84
	7	MSC LUCIA	CON	189.38	177.50	28.40	8.1	725.03	1.03	0.06	0.476	35.81	0.5	4.97	0.58	3.51	44.35	K.306	22.18
	8	CSCL KINGSTONE	CON	199.93	188.00	32.20	8.5	852.58	1.03	0.07	0.476	39.80	0.5	5.26	0.58	4.42	49.56	K.306	24.78
	9	WARNOW CHIEF	CON	180.36	169.25	25.00	7.7	617.95	1.03	0.05	0.476	32.46	0.5	4.74	0.58	2.80	40.05	K.306	20.03
	10	NORD PLUTO	BC	228.99	222.00	32.26	8.3	764.0	1.03	0.06	0.476	45.90	0.5	6.22	0.75	6.66	58.84	TI	29.42
	11	ASIA PESONA	GC	75.00	70.00	12.50	3.0	190.55	1.03	0.02	0.476	5.23	0.5	1.96	0.70	0.27	7.48		7.48
	12	PULAU HOKI	CON	121.00	114.00	20.80	6.0	403.11	1.03	0.03	0.476	17.04	0.5	3.19	0.58	1.22	21.49	KDJ	10.74
	13	SINAR JEPARA	CON	114.80	107.70	16.20	5.2	304.93	1.03	0.03	0.476	13.95	0.5	3.02	0.58	0.78	17.77	KDJ	8.89
	14	MENTARI SEJAHTERA	GC	84.57	79.00	15.00	4.6	241.57	1.03	0.02	0.476	9.05	0.5	2.21	0.70	0.57	11.85	FI	5.93
	15																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Friday, 13 October 2017	1	MUNDU	OT	90.00	84.00	15.20	3.9	184.84	1.03	0.02	0.517	9.62	0.5	2.35	0.800	0.60	12.58		12.58
	2	MERATUS KARIMATA	CON	119.90	115.00	21.80	4.4	420.33	1.03	0.04	0.517	14.85	0.5	3.22	0.58	0.95	19.06		9.53
	3	KIRANA	RO	105.80	95.00	16.60	4.85	252.2	1.03	0.02	0.517	13.53	0.5	2.66	0.58	0.66	16.86		16.86
	4	SINAR SUMBA	CON	175.00	165.00	27.40	9.4	664.07	1.03	0.06	0.517	45.53	0.5	4.62	0.58	3.65	53.86		26.93
	5	FATIMA III	GC	101.10	93.60	19.20	6.7	337.75	1.03	0.03	0.517	18.41	0.5	2.62	0.700	1.26	22.32		11.16
	6	SOPHIA	BC	90.87	86.90	15.00	3.0	297.2	1.03	0.03	0.517	7.65	0.5	2.43	0.58	0.34	10.45		10.45
	7	ORIENTAL GALAXY	CON	182.83	170.00	28.00	7.4	698.32	1.03	0.06	0.517	36.93	0.5	4.76	0.58	3.03	44.78		22.39
	8	MERATUS SABANG	GC	98.00	92.20	16.50	4.1	285.65	1.03	0.02	0.517	11.10	0.5	2.58	0.700	0.65	14.36		14.36
	9	HOSANA VII	TUG	32.00	28.66	8.68	2.7	55.5	1.03	0.00	0.517	2.27	0.5	0.80	0.50	0.05	3.13		3.13
	10	TOMINI DIGNITY	BC	190.00	183.05	32.26	9.7	719.5	1.03	0.06	0.517	52.12	0.5	5.13	0.75	6.42	63.73		31.87
	11	SPIL NIRMALA	CON	211.90	200.00	29.80	8.3	821.11	1.03	0.07	0.517	48.73	0.5	5.60	0.58	4.25	58.65		29.33
	12	MUTIARA PERSADA 3	PAS	151.10	138.00	23.00	6.7	514.7	1.03	0.04	0.517	27.14	0.5	3.86	0.68	2.15	33.19		16.60
	13	MERATUS SABANG	GC	98.00	92.20	16.50	4.1	285.65	1.03	0.02	0.517	11.10	0.5	2.58	0.700	0.65	14.36		14.36
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Saturday, 14 October 2017	1	MAHAKAMAH I	OT	176.53	168.00	27.70	8.0	624.58	1.03	0.05	0.613	55.56	0.5	4.70	0.800	4.45	64.77	FU	32.39
	2	FATIMA III	GC	101.10	93.60	19.20	4.8	337.75	1.03	0.03	0.613	18.57	0.5	2.62	0.700	0.90	22.13	A14	11.06
	3	INTAN DAYA 17	GC	98.90	92.00	23.50	5.1	408.74	1.03	0.03	0.613	19.40	0.5	2.58	0.700	1.15	23.16		23.16
	4	MENTARI TRADER	GC	79.27	73.00	12.00	2.7	187.54	1.03	0.02	0.613	8.15	0.5	2.04	0.700	0.25	10.46		10.46
	5	Tb. LLB SUKSES 08	TUG	23.50	22.17	7.32	3.0	36.7	1.03	0.00	0.613	2.75	0.5	0.62	0.50	0.04	3.41		3.41
	6	SINAR SUMBA	CON	175.00	165.00	27.40	9.4	664.07	1.03	0.06	0.613	64.12	0.5	4.62	0.58	3.65	72.45	FI	36.22
	7	WAN HAI 216	CON	174.60	164.00	27.00	7.7	653.40	1.03	0.06	0.613	52.21	0.5	4.59	0.58	2.93	59.78	OV	29.89
	8	TANTO SEMANGAT	CON	140.00	132.00	20.50	7.4	432.32	1.03	0.04	0.613	40.38	0.5	3.70	0.58	1.72	45.84	K.306	22.92
	9	MARTINE	BC	229.00	219.90	36.50	6.9	840.0	1.03	0.07	0.613	62.73	0.5	6.16	0.75	6.21	75.16	K.306	37.58
	10	LEGUNDI	RO	109.40	99.57	19.60	3.8	326.9	1.03	0.03	0.613	15.64	0.5	2.79	0.68	0.75	19.21		19.21
	11	ORIENTAL GALAXY	CON	182.83	170.00	28.00	7.4	698.32	1.03	0.06	0.613	52.01	0.5	4.76	0.58	3.03	59.85	OV	29.93
	12	PASIFIC 88	LCT	88.40	79.30	15.00	5.8	212.7	1.03	0.02	0.613	19.01	0.5	2.22	0.70	0.72	21.97		21.97
	13	LUNA BLUE	GC	124.55	115.00	20.50	6.3	403.84	1.03	0.03	0.613	29.95	0.5	3.22	0.700	1.55	34.76	K.315	17.38
	14	PULAU NUNUKAN	GC	119.20	112.00	20.80	4.2	399.74	1.03	0.03	0.613	19.45	0.5	3.14	0.700	1.02	23.64	A14	11.82
	15	NORD PLUTO	BC	228.99	222.00	32.26	7.1	764.0	1.03	0.06	0.613	65.16	0.5	6.22	0.75	5.70	77.14	K.315	38.57
	16	TANTO SEPAKAT	GC	106.00	96.30	17.50	6.2	315.55	1.03	0.03	0.613	24.68	0.5	2.70	0.700	1.09	28.50	RU	14.25
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED															
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Sunday, 15 October 2017	1	DEVA	CON	171.00	164.00	25.00	9.2	596.91	1.03	0.05	0.694	80.05	0.4	2.94	0.58	3.27	86.31	OV	43.16
	2	SINAR AMBON	GC	97.20	90.00	15.60	4.7	268.95	1.03	0.02	0.694	22.44	0.4	1.61	0.700	0.69	24.77		24.77
	3	DONG HAE STAR	BC	228.90	222.06	32.24	10.0	763.5	1.03	0.06	0.694	117.82	0.4	3.98	0.75	8.03	129.89	K.306	64.94
	4	SUMBER 5	TUG	21.95	20.41	6.10	2.1	26.0	1.03	0.00	0.694	2.32	0.4	0.37	0.50	0.02	2.71		2.71
	5	KITRAN 31	OT	80.00	75.00	10.30	3.3	148.10	1.03	0.01	0.694	13.13	0.4	1.34	0.800	0.30	14.79		14.79
	6	SMB II	LPG	113.50	105.00	16.30	7.0	250.99	1.03	0.02	0.694	39.00	0.4	1.88	0.800	1.43	42.33	JB	21.17
	7	GENCO LOIRE	BC	189.90	182.00	32.30	7.9	720.2	1.03	0.06	0.694	76.28	0.4	3.26	0.75	5.21	84.81	JB	42.41
	8	RORO PRAYESTI	RO	184.50	171.00	26.50	6.2	736.8	1.03	0.06	0.694	56.25	0.4	3.06	0.58	2.41	61.79	JB	30.90
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED															
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Monday, 16 October 2017	1	GRESIK - SURABAYA																	
	2	FLORES SEA	GC	128.50	121.32	19.00	6.2	381.04	0.51	0.01	0.765	48.45	0.4	2.17	0.700	1.50	52.13	OV	26.06
	3	NORD VILAN	CON	93.00	87.00	15.00	3.4	252.94	0.51	0.01	0.765	19.05	0.4	1.56	0.58	0.38	21.00	K.306	10.50
	4	SERASI I	RO	107.14	100.00	18.30	5.3	293.1	0.51	0.01	0.765	34.14	0.4	1.79	0.58	0.83	36.77	RU02	18.39
	5	SINAR SABANG	CON	175.00	165.00	27.40	10.8	664.07	0.51	0.01	0.765	114.79	0.4	2.96	0.58	4.20	121.95	TI	60.98
	6	SAVIOUR	GC	101.10	93.60	19.20	5.4	337.75	0.51	0.01	0.765	32.56	0.4	1.68	0.70	1.02	35.26	K.306	17.63
	7	NAJADE	CON	215.29	205.93	29.80	7.8	830.19	0.51	0.02	0.765	103.47	0.4	3.69	0.58	4.11	111.29	K.306	55.64
	8	HIJAU JELITA	CON	135.80	127.00	23.00	6.0	476.36	0.51	0.01	0.765	49.08	0.4	2.28	0.58	1.51	52.88	KDJ	26.44
	9	ORIENTAL EMERALD	CON	159.50	150.00	25.00	4.9	571.06	0.51	0.01	0.765	47.34	0.4	2.69	0.58	1.58	51.62	K.315	25.81
	10	NAVIGATOR ARIES	LPG	160.00	152.20	25.60	7.1	587.41	0.51	0.01	0.765	69.61	0.4	2.73	0.800	3.31	75.66	OV	37.83
	11	CSCL SANTIAGO	CON	208.90	196.80	29.90	10.9	815.80	0.51	0.02	0.765	138.18	0.4	3.53	0.58	5.51	147.23	K.315	73.62
	12	KOTA NASRAT	CON	179.70	169.30	27.60	10.5	680.58	0.51	0.01	0.765	114.51	0.4	3.03	0.58	4.22	121.77	K.315	60.89
	13	MERATUS BANJAR 1	CON	129.93	120.70	20.00	3.2	403.67	0.51	0.01	0.765	24.88	0.4	2.16	0.58	0.66	27.71	OV	13.86
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Tuesday, 17 October 2017	1	NORTHERN VIVACITY	CON	221.74	209.62	29.80	10.3	847.48	1.03	0.07	0.83	166.77	0.4	3.83	0.58	5.53	176.20	K.315	88.10
	2	GULF MAS	CON	107.80	105.60	18.00	4.4	327.48	1.03	0.03	0.83	35.17	0.4	1.89	0.58	0.72	37.81	KJ	18.90
	3	TRIFOSA	GC	100.20	89.80	18.80	8.0	329.19	1.03	0.03	0.83	54.38	0.4	1.61	0.70	1.41	57.43	KDJ	28.71
	4	MULTI SPIRIT	GC	91.30	84.00	15.10	3.7	252.32	1.03	0.02	0.83	23.53	0.4	1.51	0.70	0.49	25.54	KJ	12.77
	5	MENTARI SELARAS	CON	96.50	90.80	15.80	4.0	271.40	1.03	0.02	0.83	27.49	0.4	1.63	0.58	0.49	29.64	RU02	14.82
	6	KOTA NASTRAT	CON	179.70	169.30	27.60	10.5	680.58	1.03	0.06	0.83	134.56	0.4	3.03	0.58	4.22	141.87	OV	70.93
	7	NAVIGATOR ARIES	LPG	160.00	152.20	25.60	10.5	587.41	1.03	0.05	0.83	120.97	0.4	2.73	0.80	4.89	128.64	K.315	64.32
	8	MUTIA LADJONI 7	GC	83.75	78.00	14.50	5.0	232.45	1.03	0.02	0.83	29.52	0.4	1.40	0.70	0.59	31.53	RU02	15.77
	9	NORD VILAN	CON	93.00	87.00	15.00	3.8	252.9	1.03	0.02	0.83	25.02	0.4	1.56	0.58	0.43	27.03		27.03
	10	TANTO HANDAL	GC	98.35	91.89	17.00	4.7	294.84	1.03	0.02	0.83	32.69	0.4	1.65	0.70	0.77	35.13	KN	17.57
	16																		
	17																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Wednesday, 18 October 2017	1	MSC GIANNA	CON	201.56	190.00	32.30	12.2	859.96	1.03	0.07	0.879	196.94	0.7	10.43	0.58	6.44	213.87	K.306	106.94
	2	TANTO SUBUR 2	CON	113.00	103.80	19.00	5.2	354.56	1.03	0.03	0.879	45.86	0.7	5.70	0.58	0.88	52.47	K.306	26.23
	3	MARTINE	BC	229.00	219.90	36.50	6.0	840.0	1.03	0.07	0.879	112.10	0.7	12.07	0.75	5.40	129.63	K.306	64.82
	4	ALIDRA	CON	168.70	158.00	27.20	7.5	643.81	1.03	0.05	0.879	100.68	0.7	8.67	0.58	2.77	112.17	K.306	56.09
	5	STAR HIDRA	GC	192.00	187.00	31.00	8.5	798.70	1.03	0.07	0.879	135.04	0.7	10.26	0.700	5.16	150.53	K.306	75.26
	6	MERATUS BONTANG	GC	106.68	99.10	20.60	3.5	372.71	1.03	0.03	0.879	29.47	0.7	5.44	0.700	0.75	35.69	RT	17.84
	7	RED ROCK	GC	100.00	95.50	18.20	6.0	318.35	1.03	0.03	0.879	48.68	0.7	5.24	0.700	1.09	55.04	RT	27.52
	8	MERATUS KARIANGAU	CON	119.90	115.00	21.80	4.6	420.33	1.03	0.04	0.879	44.94	0.7	6.31	0.58	0.99	52.28	OV	26.14
	9	ARGO	CON	120.00	115.20	22.00	3.2	424.4	1.03	0.04	0.879	31.32	0.7	6.32	0.58	0.70	38.37		38.37
	10	MENTARI SELARAS	CON	96.50	90.80	15.80	4.8	271.40	1.03	0.02	0.879	37.03	0.7	4.98	0.58	0.59	42.63	RU	21.31
	11	TANTO SUBUR 2	CON	113.00	103.80	19.00	5.2	354.56	1.03	0.03	0.879	45.86	0.7	5.70	0.58	0.88	52.47	AXIV	26.23
	12	KISIK MAS	CON	144.00	134.00	21.50	4.3	461.14	1.03	0.04	0.879	48.95	0.7	7.35	0.58	1.06	57.41	AXIV	28.71
	13	TANTO SENTOSA	CON	105.00	96.10	20.00	6.2	358.83	1.03	0.03	0.879	50.62	0.7	5.27	0.58	1.02	56.95	K.315	28.47
	14	SINAR MOROTAI	OT	95.32	90.00	14.60	5.6	205.79	1.03	0.02	0.879	42.82	0.7	4.94	0.800	0.88	48.66		48.66
	15	SINAR BELAWAN	CON	145.68	137.21	25.00	5.5	539.99	1.03	0.05	0.879	64.12	0.7	7.53	0.58	1.62	73.31	FI	36.66
	16	SINAR MOROTAI	OT	95.32	90.00	14.60	6.2	205.79	1.03	0.02	0.879	47.41	0.7	4.94	0.800	0.97	53.34	FI	26.67
	17	MSC GIANNA	CON	201.56	190.00	32.30	8.0	859.96	1.03	0.07	0.879	129.14	0.7	10.43	0.58	4.22	143.86	FI	71.93
	18	LINTAS BATANG HARI	GC	85.95	74.92	13.6	3.2	220.71	1.03	0.02	0.879	27.78	0.7	4.11	0.70	0.34	32.25	FI	16.12
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Thursday, 19 October 2017	1	WARNOW CHIEF	CON	180.36	169.25	25.00	7.0	617.95	0.51	0.01	0.868	98.22	0.5	4.74	0.58	2.55	102.97	K.306	51.48
	2	SENDANG MAS	CON	215.10	205.28	29.80	7.9	829.69	0.51	0.02	0.868	134.40	0.5	5.75	0.58	4.15	144.32	K.306	72.16
	3	MENTAYA RIVER	GC	101.30	94.20	17.10	5.4	301.11	0.51	0.01	0.868	42.16	0.5	2.64	0.700	0.91	45.71	A.14	22.86
	4	SERENA III	OT	91.00	84.30	13.50	3.5	188.71	0.51	0.00	0.868	24.45	0.5	2.36	0.800	0.48	27.29		27.29
	5	KGM GOLF	TUG	20.35	18.93	6.60	2.5	28.9	0.51	0.00	0.868	3.84	0.5	0.53	0.50	0.02	4.40		4.40
	6	NORTHERN DEMOCRAT	CON	230.92	214.00	32.20	9.8	942.31	0.51	0.02	0.868	173.81	0.5	5.99	0.58	5.80	185.62	K.315	92.81
	7	UNI AMPLE	CON	165.01	150.00	27.10	7.2	632.45	0.51	0.01	0.868	89.51	0.5	4.20	0.58	2.52	96.24	TI	48.12
	8	GRIYA DAYAK	OT	65.00	60.90	10.00	3.8	99.81	0.51	0.00	0.868	19.18	0.5	1.71	0.800	0.28	21.16		21.16
	9	STRAIT MAS	CON	163.66	152.00	26.00	4.5	603.62	0.51	0.01	0.868	56.69	0.5	4.26	0.58	1.53	62.48	K.306	31.24
	10	SINAR AMBON	GC	97.20	90.00	15.60	4.6	981.17	0.51	0.02	0.868	34.31	0.5	2.52	0.700	0.68	37.53	RU	18.76
	11	CURUG MAS	CON	107.80	105.60	18.00	4.5	327.48	0.51	0.01	0.868	39.38	0.5	2.96	0.58	0.74	43.08	RU	21.54
	12	UMSINI	PAS	144.00	130.00	23.40	6.5	506.5	0.51	0.01	0.868	70.03	0.5	3.64	0.68	2.00	75.68		75.68
	13	TB. GLOBAL MANDIRI V	TUG	22.20	19.50	6.40	2.4	28.4	0.51	0.00	0.868	3.88	0.5	0.55	0.50	0.02	4.45		4.45
	14	NAVIGATOR GLOBAL	LPG	154.00	147.00	25.50	7.6	592.04	0.51	0.01	0.868	92.59	0.5	4.12	0.800	3.41	100.12	K.315	50.06
	15	BINTANG JIASIA 35	CON	116.40	107.96	19.20	4.3	364.16	0.51	0.01	0.868	38.47	0.5	3.02	0.58	0.77	42.28	FI	21.14
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Friday, 20 October 2017	1	HIJAU TERANG	GC	132.30	122.20	20.20	8.2	412.01	1.03	0.03	0.847	79.02	0.5	3.42	0.700	2.12	84.59	KDJ	42.30
	2	MITRA SEJATRAH	TUG	20.04	18.08	6.00	2.4	24.3	1.03	0.00	0.847	3.42	0.5	0.51	0.50	0.02	3.95		3.95
	3	LAGUN MAS	GC	96.50	90.80	15.80	5.0	271.40	1.03	0.02	0.847	35.80	0.5	2.54	0.700	0.75	39.12	K.306	19.56
	4	SENDANG MAS	CON	215.10	205.28	29.80	7.9	829.69	1.03	0.07	0.847	127.88	0.5	5.75	0.58	4.15	137.86	K.315	68.93
	5	PALUNG MAS	CON	107.80	105.60	18.00	3.7	327.48	1.03	0.03	0.847	30.81	0.5	2.96	0.58	0.60	34.40	K.315	17.20
	6	SELATAN DAMAI	OT	116.00	108.74	21.00	5.9	295.83	1.03	0.03	0.847	50.59	0.5	3.04	0.80	1.61	55.27	K.315	27.64
	7	WAN HAI 216	CON	174.60	164.00	27.00	7.7	653.40	1.03	0.06	0.847	99.58	0.5	4.59	0.58	2.93	107.16	K.315	53.58
	8	MUTIARA PERSADA 3	PAS	151.10	138.00	23.00	6.7	514.7	1.03	0.04	0.847	72.91	0.5	3.86	0.68	2.15	78.96	K.315	39.48
	9	MUARA MAS	CON	107.80	105.60	18.00	4.8	327.48	1.03	0.03	0.847	39.97	0.5	2.96	0.58	0.78	43.74	DU	21.87
	10	SURYA PEKIK	GC	97.80	90.20	17.30	5.0	299.19	1.03	0.03	0.847	35.56	0.5	2.53	0.700	0.82	38.93		38.93
	11	MENTARI	LCT	76.25	73.15	24.39	4.3	439.4	1.03	0.04	0.847	24.57	0.5	2.05	0.700	0.80	27.45	KDJ	13.73
	12	GUNUNG DEMPO	PAS	146.60	130.00	23.40	6.0	513.9	1.03	0.04	0.847	61.51	0.5	3.64	0.68	1.84	67.03		67.03
	13	HIJAU TERANG	GC	132.30	122.20	20.20	8.2	412.01	1.03	0.03	0.847	79.02	0.5	3.42	0.700	2.12	84.59		84.59
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Saturday, 21 October 2017	1	KOTA JUTA	CON	193.00	182.78	32.00	8.4	827.35	1.03	0.07	0.795	145.65	0.4	3.28	0.58	4.22	153.22	TI	76.61
	2	MILA UTAMA	RO	134.90	126.00	20.00	5.2	388.8	1.03	0.03	0.795	45.58	0.4	2.26	0.68	1.32	49.19	OV	24.60
	3	MUTIARA PERSADA III	PAS	151.10	138.00	23.00	6.7	514.7	1.03	0.04	0.795	64.32	0.4	2.47	0.68	2.15	68.98	OV	34.49
	4	MERATUS PALEMBANG	GC	117.00	110.00	19.70	5.1	374.71	1.03	0.03	0.795	39.03	0.4	1.97	0.700	1.16	42.19	K.315	21.09
	5	TANTO TANGGUH	CON	144.80	134.00	22.40	4.8	482.06	1.03	0.04	0.795	44.74	0.4	2.40	0.58	1.24	48.43	TBN	24.21
	6	INTAN DAYA 88	GC	89.80	82.90	16.60	4.9	275.14	1.03	0.02	0.795	28.26	0.4	1.49	0.700	0.71	30.47		30.47
	7	SINAR SABANG	CON	175.00	165.00	27.40	11.1	664.07	1.03	0.06	0.795	127.41	0.4	2.96	0.58	4.31	134.74	K.315	67.37
	8	NEW LIFE	BC	169.00	159.63	27.00	5.5	601.4	1.03	0.05	0.795	61.08	0.4	2.86	0.75	2.66	66.64	K.315	33.32
	9	ISA EXPRESS	BC	185.70	177.00	30.40	11.0	681.3	1.03	0.06	0.795	135.44	0.4	3.17	0.75	6.64	145.31	OV	72.65
	10	PALUNG MAS	CON	107.80	105.60	18.00	3.7	327.48	1.03	0.03	0.795	27.18	0.4	1.89	0.58	0.60	29.71	OV	14.85
	11	CPO NORFOLK	CON	262.07	248.01	32.20	9.4	1032.50	1.03	0.09	0.795	162.18	0.4	4.44	0.58	6.45	173.16	OV	86.58
	12	LINTAS BARITO	GC	85.30	76.80	13.60	3.2	219.91	1.03	0.02	0.795	17.10	0.4	1.38	0.700	0.35	18.84		18.84
	13	CIREMAI	PAS	146.50	130.00	23.70	5.8	522.2	1.03	0.04	0.795	52.45	0.4	2.33	0.68	1.80	56.63		56.63
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Sunday, 22 October	1	KIRANA IX	RO	119.00	110.73	20.40	5.1	365.6	0.5	0.01	0.72	32.22	0.4	1.98	0.68	1.16	35.38		35.38
	2	TANTO RAYA	CON	120.84	111.66	20.20	6.0	391.19	0.5	0.01	0.72	38.23	0.4	2.00	0.58	1.16	41.40	FI	20.70
	3	TANTO TANGGUH	CON	144.80	134.00	22.40	5.9	482.06	0.5	0.01	0.72	45.11	0.4	2.40	0.58	1.52	49.04	FI	24.52
	4	SANTIKA NUSANTARA	RO	141.75	133.06	20.00	5.8	403.0	0.5	0.01	0.72	44.04	0.4	2.38	0.68	1.56	47.99	TI	23.99
	5	PRATIWI RAYA	GC	96.90	90.80	15.80	4.7	271.97	0.5	0.01	0.72	24.35	0.4	1.63	0.700	0.71	26.69		26.69
	6	KMTC NHAVA SHEVA	CON	261.40	245.40	32.50	9.8	1040.17	0.5	0.02	0.72	137.22	0.4	4.40	0.58	6.72	148.36	K.306	74.18
	7	MERATUS BATAM	CON	138.87	128.70	24.20	6.4	507.89	0.5	0.01	0.72	47.00	0.4	2.31	0.58	1.71	51.03	TI	25.51
	8	SPIL CAYA	CON	231.00	214.20	32.20	9.3	942.54	0.5	0.02	0.72	113.67	0.4	3.84	0.58	5.51	123.04	K.306	61.52
	9	SINAR SABANG	CON	175.00	165.00	27.40	11.1	664.07	0.5	0.01	0.72	104.50	0.4	2.96	0.58	4.31	111.79	K.306	55.89
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED															
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Monday, 23 October 2017	1	EASTGATE	BC	176.60	169.40	26.00	9.1	592.1	1.03	0.05	0.637	68.72	0.4	3.04	0.75	4.49	76.30	FI	38.15
	2	NORTHERN DIAMOND	CON	230.93	214.00	32.20	10.5	942.34	1.03	0.08	0.637	100.18	0.4	3.83	0.58	6.22	110.31	FI	55.15
	3	GUNUNG DEMPO	PAS	146.60	130.00	23.40	6.0	513.9	1.03	0.04	0.637	34.77	0.4	2.33	0.68	1.84	38.99		38.99
	4	COUGAR	OT	119.00	111.61	19.00	8.7	309.97	1.03	0.03	0.637	43.29	0.4	2.00	0.80	2.21	47.52	K.315	23.76
	5	SAWU SEA	GC	128.50	121.32	19.00	6.6	381.04	1.03	0.03	0.637	35.70	0.4	2.17	0.700	1.59	39.50	K.315	19.75
	6	KANAL MAS	CON	119.90	115.00	21.80	4.0	420.33	1.03	0.04	0.637	20.51	0.4	2.06	0.58	0.86	23.47	K.315	11.73
	7	CSCL SAN JOSE	CON	208.90	196.90	29.90	8.4	815.80	1.03	0.07	0.637	73.74	0.4	3.53	0.58	4.25	81.58	FI	40.79
	8	KABOGA BARU II	CON	79.07	71.6	13.40	3.2	209.17	1.03	0.02	0.637	10.21	0.4	1.28	0.58	0.26	11.78		11.78
	9	PEDHOULAS FARMER	BC	229.00	225.00	32.30	10.1	764.7	1.03	0.06	0.637	101.31	0.4	4.03	0.75	8.23	113.64	K.315	56.82
	10	Tb. GLOBAL MANDIRI	TUG	22.20	19.50	6.40	2.4	28.4	1.03	0.00	0.637	2.09	0.4	0.35		-	2.44		1.22
	11	SURABAYA-GRESIK														-			
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED															
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Tuesday, 24 October 2017	1	TRUONG MINH DRAGON	GC	136.40	126.00	20.20	8.4	1718.92	1.03	0.15	0.519	31.33	0.3	1.27	0.700	2.24	34.98	MIII	17.49
	2	SICHEM MELBOURNE	OT	127.20	119.00	20.40	6.3	349.90	1.03	0.03	0.519	22.19	0.3	1.20	0.800	1.83	25.25	MIII	12.62
	3	SANGGAU	OT	183.00	175.50	32.50	7.2	664.22	1.03	0.06	0.519	37.40	0.3	1.77	0.800	4.91	44.14	JR	22.07
	4	MERATUS BONTANG	GC	106.68	99.10	20.60	4.4	1256.11	1.03	0.11	0.519	12.91	0.3	1.00	0.700	0.94	14.95	KJ	7.48
	5	DARYA LOK	BC	229.00	225.00	32.30	9.7	764.7	1.03	0.06	0.519	64.60	0.3	2.27	0.75	7.90	74.84	K.315	37.42
	6	MUARA MAS	CON	107.80	105.60	18.00	4.8	327.48	1.03	0.03	0.519	15.00	0.3	1.06	0.58	0.78	16.88	KJ	8.44
	7	SAWU SEA	GC	128.50	121.32	19.00	5.5	381.04	1.03	0.03	0.519	19.75	0.3	1.22	0.700	1.33	22.33	KJ	11.17
	8	MERATUS SABANG	GC	98.00	92.20	16.50	4.4	285.65	1.03	0.02	0.519	12.01	0.3	0.93	0.700	0.70	13.66	KJ	6.83
	9	MERATUS GORONTALO	CON	161.85	150.00	25.60	6.8	590.17	1.03	0.05	0.519	30.19	0.3	1.51	0.58	2.24	34.00	TB	17.00
	10	NORTHERN DIAMOND	CON	230.93	214.00	32.20	10.5	942.34	1.03	0.08	0.519	66.51	0.3	2.16	0.58	6.22	74.96	OV	37.48
	11	LABOBAR	PAS	146.50	130.00	23.40	5.9	513.6	1.03	0.04	0.519	22.70	0.3	1.31	0.68	1.81	25.87		25.87
	12	XONNE	BC	170.00	166.00	24.20	5.8	575.63	1.03	0.05	0.519	28.50	0.3	1.67	0.75	2.61	32.83	JB	16.42
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Wednesday, 25 October 2017	1	BERKAH 36	BC	174.00	164.62	27.50	5.7	616.0	1.03	0.05	0.397	16.23	0.3	1.66	0.75	2.89	20.84	MIII	10.42
	2	ASIA GLORY	GC	100.64	92.80	18.80	5.4	329.93	1.03	0.03	0.397	8.67	0.3	0.94	0.700	0.99	10.62	MIII	5.31
	3	CAPE MORETON	CON	221.69	209.62	29.80	9.8	847.34	1.03	0.07	0.397	35.53	0.3	2.11	0.58	5.26	42.98	K.315	21.49
	4	MERATUS SABANG	GC	98.00	92.20	16.50	4.4	285.65	1.03	0.02	0.397	7.02	0.3	0.93	0.700	0.70	8.67	TB	4.34
	5	SMB II	LPG	113.50	105.00	16.30	7.3	250.99	1.03	0.02	0.397	13.26	0.3	1.06	0.800	1.49	15.83	MIII	7.92
	6	HUMMING BIRD	LPG	97.69	89.90	16.00	7.2	257.15	1.03	0.02	0.397	11.20	0.3	0.91	0.800	1.24	13.36	MIII	6.68
	7	Tb. PRIME 16	TUG	23.50	21.33	7.32	2.3	36.7	1.03	0.00	0.397	0.85	0.3	0.22	0.50	0.03	1.09		1.09
	8	VEGA STAR	BC	157.50	148.00	25.00	9.4	552.4	1.03	0.05	0.397	24.06	0.3	1.49	0.75	3.90	29.50	MIII	14.75
	9	PORADO	BC	130.00	126.00	21.00	4.2	449.4	1.03	0.04	0.397	9.15	0.3	1.27	0.75	1.25	11.71		11.71
	10	PUPUK INDONESIA	LPG	159.00	135.15	25.60	7.0	589.05	1.03	0.05	0.397	16.36	0.3	1.36	0.800	2.90	20.67	JB	10.34
	11	THOR INFINITY	BC	189.99	182.00	32.26	10.8	719.5	1.03	0.06	0.397	34.00	0.3	1.83	0.75	7.11	43.00	MIII	21.50
	12	RORO PRYASTI	RO	184.50	171.00	26.50	6.4	736.8	1.03	0.06	0.397	18.93	0.3	1.72	0.58	2.49	23.21	JB	11.60
	13	ASIKE GLOBAL	GC	98.70	90.00	18.00	5.2	312.75	1.03	0.03	0.397	8.10	0.3	0.91	0.70	0.88	9.91	JB	4.96
	14	TUNAS BARU	BC	179.90	176.85	30.00	7.0	667.5	1.03	0.06	0.397	21.41	0.3	1.78	0.75	4.16	27.42	MIII	13.71
	15	HAMBURG PEARL	BC	180.00	170.23	30.00	7.2	667.7	1.03	0.06	0.397	21.20	0.3	1.72	0.75	4.12	27.10	JB	13.55
	16	MARINA 1611	TUG	32.00	26.00	8.00	2.8	48.3	1.03	0.00	0.397	1.26	0.3	0.26	0.50	0.04	1.57	JB	0.78
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Thursday, 26 October 2017	1	TIGER ZHEJIANG	BC	199.00	188.58	32.26	6.8	729.8	0.51	0.02	0.315	14.01	0.1	0.21	0.75	4.64	18.87	JB	9.43
	2	MERATUS KAPUAS	CON	119.90	115.00	21.80	5.1	420.33	0.51	0.01	0.315	6.41	0.1	0.13	0.58	1.10	7.64	TI	3.82
	3	NAVIGATOR ARIES	LPG	160.00	152.20	25.60	6.4	587.41	0.51	0.01	0.315	10.64	0.1	0.17	0.800	2.98	13.80	TI	6.90
	4	SUNGAI MAS	CON	193.90	184.00	32.20	6.6	835.12	0.51	0.02	0.315	13.26	0.1	0.21	0.58	3.36	16.85	TI	8.42
	5	MERATUS PEKANBARU	GC	117.00	110.00	19.70	4.6	374.71	0.51	0.01	0.315	5.53	0.1	0.12	0.700	1.04	6.70	TI	3.35
	6	FELYA	GC	104.20	96.00	18.50	7.0	330.59	0.51	0.01	0.315	7.34	0.1	0.11	0.700	1.30	8.75	AXIV	4.38
	7	LYOLIA	GC	120.00	117.00	20.20	4.7	389.7	0.51	0.01	0.315	6.01	0.1	0.13	0.700	1.16	7.31	FI	3.65
	8	VALERIE SCHULTE	CON	221.00	210.00	30.00	8.2	851.17	0.51	0.02	0.315	18.81	0.1	0.24	0.58	4.44	23.50	OV	11.75
	9	MITRA PROGRESS III	CON	100.60	95.90	18.80	6.5	329.86	0.51	0.01	0.315	6.81	0.1	0.11	0.58	1.01	7.93	KDJ	3.96
	10	MENTARI SUCCESS	GC	85.80	79.94	15.00	3.9	243.23	0.51	0.01	0.315	3.41	0.1	0.09	0.700	0.49	3.99		3.99
	11	ORIENTAL GALAXY	CON	182.83	170.00	28.00	6.0	698.32	0.51	0.01	0.315	11.14	0.1	0.19	0.58	2.48	13.82	K.315	6.91
	12	PELANGI MAS	OT	83.80	79.00	18.00	4.0	161.65	0.51	0.00	0.315	3.45	0.1	0.09	0.800	0.68	4.22	K.315	2.11
	13	AS MARINE	CON	83.00	77.28	18.00	3.0	287.34	0.51	0.01	0.315	2.53	0.1	0.09	0.58	0.36	2.99		1.49
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Friday, 27 October 2017	1	DARYA LOK	BC	229.00	225.00	32.30	7.0	764.7	1.03	0.06	0.287	14.29	0.2	1.01	0.75	5.70	21.07	TI	10.53
	2	SPIL NINGSIH	CON	208.30	195.00	29.80	6.8	811.46	1.03	0.07	0.287	12.03	0.2	0.87	0.58	3.40	16.37	OV	8.19
	3	PRATIWI RAYA	GC	96.90	90.80	15.80	4.7	271.97	1.03	0.02	0.287	3.87	0.2	0.41	0.700	0.71	5.01	KDJ	2.50
	4	MERATUS KAPUAS	CON	119.90	115.00	21.80	5.0	420.33	1.03	0.04	0.287	5.22	0.2	0.52	0.58	1.08	6.85	OV	3.42
	5	KURAU	OT	105.00	99.00	18.80	5.2	246.28	1.03	0.02	0.287	4.67	0.2	0.44	0.800	1.16	6.29	KDJ	3.15
	6	SEMPATI	TUG	23.54	22.08	7.30	2.8	36.5	1.03	0.00	0.287	0.56	0.2	0.10	0.50	0.03	0.70		0.70
	7	TIGA RODA	BC	129.50	123.80	20.60	7.4	441.6	1.03	0.04	0.287	8.31	0.2	0.55	0.75	2.12	11.02	KDJ	5.51
	8	MAIDEN ENERGY	OT	167.00	158.00	27.40	10.1	567.48	1.03	0.05	0.287	14.48	0.2	0.71	0.800	5.23	20.47	TBN	10.23
	9	MUTIARA PERSADA 3	PAS	151.10	138.00	23.00	6.7	514.7	1.03	0.04	0.287	8.39	0.2	0.62	0.68	2.15	11.20	FI	5.60
	10	ANTHOS	BC	225.00	217.40	32.20	8.0	758.4	1.03	0.06	0.287	15.78	0.2	0.97	0.75	6.28	23.10	TI	11.55
	11	WAN HAI 212	CON	174.60	164.00	27.00	8.0	653.40	1.03	0.06	0.287	11.91	0.2	0.73	0.58	3.04	15.74	FI	7.87
	12	HARRY 06	TUG	29.00	26.44	8.40	3.6	50.4	1.03	0.00	0.287	0.86	0.2	0.12	0.50	0.06	1.05		1.05
	13	SINAR SUMBA	CON	175.00	165.00	27.40	9.4	664.07	1.03	0.06	0.287	14.08	0.2	0.74	0.58	3.65	18.52	K.315	9.26
	14	OCEAN HIRYU	BC	188.50	179.00	32.26	7.5	717.8	1.03	0.06	0.287	12.18	0.2	0.80	0.75	4.86	17.90	TBN	8.95
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Saturday, 28 October 2017	1	TANTO SEMANGAT	CON	140.00	132.00	20.50	7.2	432.32	0.51	0.01	0.341	12.14	0.4	2.37	0.58	1.67	16.19	TI	8.10
	2	MUTIARA PERSADA 3	PAS	151.10	138.00	23.00	6.7	514.7	0.51	0.01	0.341	11.81	0.4	2.47	0.68	2.15	16.44	TBN	8.22
	3	SUNGAI MAS	CON	193.90	184.00	32.20	6.6	835.12	0.51	0.02	0.341	15.52	0.4	3.30	0.58	3.36	22.19	K.315	11.10
	4	MERATUS BENOA	GC	106.68	99.10	20.60	4.2	372.71	0.51	0.01	0.341	5.32	0.4	1.78	0.700	0.90	8.00	AXIV	4.00
	5	MERATUS BANJAR I	CON	129.93	120.70	20.00	6.5	403.67	0.51	0.01	0.341	10.04	0.4	2.16	0.58	1.35	13.56	KDJ	6.78
	6	AYER MAS	GC	95.00	86.00	16.00	3.1	272.68	0.51	0.01	0.341	3.41	0.4	1.54	0.700	0.45	5.40	AXIV	2.70
	7	MSC GIANNA	CON	201.56	190.00	32.30	10.9	859.96	0.51	0.02	0.341	26.46	0.4	3.40	0.58	5.75	35.63	K.315	17.82
	8	RORO SAWITRI	GC	118.10	108.00	19.60	5.4	374.74	0.51	0.01	0.341	7.45	0.4	1.94	0.700	1.20	10.59	TBN	5.30
	9	SINAR SUMBA	CON	175.00	165.00	27.40	9.4	664.07	0.51	0.01	0.341	19.82	0.4	2.96	0.58	3.65	26.44	FI	13.22
	10	KURAU	OT	105.00	99.00	18.80	6.0	246.28	0.51	0.01	0.341	7.59	0.4	1.77	0.800	1.34	10.70	AXIV	5.35
	11	TANTO LUAS	CON	119.90	115.00	21.80	4.3	420.33	0.51	0.01	0.341	6.32	0.4	2.06	0.58	0.93	9.31	AXIV	4.66
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Monday, 29 October 2017	1	HIJAU TERANG	GC	132.30	122.20	20.20	5.2	412.01	1.03	0.03	0.416	12.09	0.3	1.23	0.700	1.34	14.70	FTM	7.35
	2	NAVIGATOR GLOBAL	LPG	154.00	147.00	25.50	7.2	592.04	1.03	0.05	0.416	20.13	0.3	1.48	0.800	3.23	24.89	FI	12.45
	3	PULAU WETAR	GC	120.90	114.00	20.00	6.3	387.43	1.03	0.03	0.416	13.66	0.3	1.15	0.700	1.50	16.35	FI	8.17
	4	FATIMA III	GC	101.10	93.60	19.20	5.7	337.75	1.03	0.03	0.416	10.15	0.3	0.94	0.700	1.07	12.19	ANGD	6.10
	5	MERATUS BATAM	CON	138.87	128.70	24.20	3.4	507.89	1.03	0.04	0.416	8.32	0.3	1.30	0.58	0.91	10.57	TI	5.29
	6	MAIDEN ENERGY	OT	167.00	158.00	27.40	9.2	567.48	1.03	0.05	0.416	27.65	0.3	1.59	0.800	4.76	34.05	TBN	17.03
	7	GH ZONDA	CON	231.00	214.00	32.20	9.3	942.54	1.03	0.08	0.416	37.86	0.3	2.16	0.58	5.51	45.60	TBN	22.80
	8	HONGKONG BRIDGE	CON	259.80	244.80	32.30	9.2	1029.12	1.03	0.09	0.416	42.84	0.3	2.47	0.58	6.25	51.65	K.315	25.82
	9	TANTO SEMANGAT	CON	140.00	132.00	20.50	7.2	432.32	1.03	0.04	0.416	18.08	0.3	1.33	0.58	1.67	21.12	K.315	10.56
	10	URU BHUM	CON	194.93	186.00	32.30	10.7	840.71	1.03	0.07	0.416	37.86	0.3	1.87	0.58	5.53	45.33	K.315	22.66
	11	SPEETRUM W	OT	138.50	130.30	26.00	6.8	1976.4	1.03	0.17	0.416	16.85	0.3	1.31	0.80	2.75	21.09	FI	10.54
	12	ARMADA SEJATI	CON	114.00	105.50	18.20	7.6	341.27	1.03	0.03	0.416	15.25	0.3	1.06	0.58	1.25	17.60	FI	8.80
	13	LAGUN MAS	GC	96.50	90.80	15.80	5.0	271.40	1.03	0.02	0.416	8.64	0.3	0.92	0.700	0.75	10.32		10.32
	14	ASIA PESONA	GC	75.00	70.00	12.50	3.0	190.55	1.03	0.02	0.416	3.99	0.3	0.71	0.700	0.27	4.99		4.99
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Sunday, 30 October 2017	1	SURYA INDAH JAYA	TUG	24.50	22.17	7.32	2.4	135.1	1.03	0.01	0.508	1.51	0.1	0.02	0.50	0.03	1.58		1.58
	2	OCEAN HIRYU	BC	188.50	179.00	32.26	6.7	717.8	1.03	0.06	0.508	34.05	0.1	0.20	0.75	4.34	38.65	FI	19.32
	3	MERATUS GORONTALO	CON	161.85	151.13	25.60	7.3	590.17	1.03	0.05	0.508	31.32	0.1	0.17	0.58	2.43	33.97	FI	16.98
	4	TELUK BERAU	CON	114.30	107.60	16.00	4.6	300.45	1.03	0.03	0.508	14.05	0.1	0.12	0.58	0.68	14.88	R02	7.44
	5	Tb. CLUMENT I	TUG	30.00	28.19	9.00	3.6	57.5	1.03	0.00	0.508	2.88	0.1	0.03	0.50	0.07	2.99		2.99
	6	SURABAYA - GRESIK									0.508								
	7	PANGEMPANG	GC	106.70	98.00	16.30	6.6	294.94	1.03	0.02	0.508	18.36	0.1	0.11	0.700	1.10	19.60	JB	9.80
	8	TIGER ZHEJIANG	BC	199.00	188.58	32.26	7.1	729.8	1.03	0.06	0.508	38.01	0.1	0.21	0.75	4.84	43.13	JB	21.56
	9	Tb. SEMAR SATU	TUG	27.00	25.70	8.20	3.0	47.1	1.03	0.00	0.508	2.19	0.1	0.03	0.50	0.05	2.27		2.27
	10	GRESIK - SURABAYA									0.508								
	11	SINAR PAPUA	GC	110.00	103.00	19.70	5.9	362.31	1.03	0.03	0.508	17.25	0.1	0.12	0.700	1.25	18.65	RU	9.33
	12	ARMADA SEJATI	CON	114.00	105.50	18.20	7.6	341.27	1.03	0.03	0.508	22.76	0.1	0.12	0.58	1.25	24.16	KDJ	12.08
	13	SEGARA MAS	CON	215.29	205.28	29.80	8.6	830.19	1.03	0.07	0.508	50.12	0.1	0.23	0.58	4.52	54.94	TI	27.47
	14	URU BHUM	CON	194.93	186.00	32.30	10.5	840.71	1.03	0.07	0.508	55.44	0.1	0.21	0.58	5.42	61.14	KDJ	30.57
	15	TIGA RODA	BC	129.50	123.80	20.60	7.4	441.6	1.03	0.04	0.508	26.01	0.1	0.14	0.75	2.12	28.30	K.315	14.15
	16	AS CONSTANTINA	CON	221.69	209.62	29.80	8.7	847.34	1.03	0.07	0.508	51.77	0.1	0.23	0.58	4.67	56.75	K.315	28.37
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED															
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Tuesday, 31 October 2017	1	DARWIN	BC	224.89	215.00	32.20	8.6	758.2	1.03	0.06	0.6	73.27	0.4	3.85	0.75	6.67	83.86	K.315	41.93
	2	MITRA KENDARI	CON	121.00	113.30	18.60	7.0	360.47	1.03	0.03	0.6	31.43	0.4	2.03	0.58	1.27	34.75	KDJ	17.38
	3	DIA CHENG	GC	93.00	87.00	16.00	6.0	269.80	1.03	0.02	0.6	20.68	0.4	1.56	0.70	0.87	23.14	K.315	11.57
	4	AS SAVONIA	CON	168.00	158.00	27.20	8.5	642.10	1.03	0.05	0.6	53.22	0.4	2.83	0.58	3.14	59.24	K.315	29.62
	5	INTAN DAYA 12	GC	98.00	92.00	21.00	4.5	363.56	1.03	0.03	0.6	16.40	0.4	1.65	0.700	0.91	18.99		18.99
	6	TANTO SUBUR II	CON	113.00	103.80	19.00	5.2	354.56	1.03	0.03	0.6	21.39	0.4	1.86	0.58	0.88	24.16	KDJ	12.08
	7	SURYA PEKIK	GC	97.80	90.20	17.30	6.0	299.19	1.03	0.03	0.6	21.44	0.4	1.62	0.700	0.98	24.07		24.07
	8	MERATUS KARIANGAU	CON	119.90	115.00	21.80	3.8	420.33	1.03	0.04	0.6	17.32	0.4	2.06	0.58	0.82	20.23	KDJ	10.12
	9	TR ATHOS	CON	101.30	94.20	17.10	4.6	301.11	1.03	0.03	0.6	17.17	0.4	1.69	0.58	0.64	19.53	TBN	9.76
	10	MENTAYA RIVER	GC	221.69	209.62	29.80	8.9	847.34	1.03	0.07	0.6	73.92	0.4	3.76	0.700	5.82	83.57		83.57
	11	AS CONSTANTINA	CON	168.00	158.00	27.20	8.5	642.10	1.03	0.05	0.6	53.22	0.4	2.83	0.58	3.14	59.24	K.315	29.62
	12	AS SAVONIA	CON	168.00	158.66	27.20	8.1	642.10	1.03	0.05	0.6	50.92	0.4	2.84	0.58	3.00	56.83	K.315	28.41
TOTAL																			

ATTACHMENT 1
TIME OPERATION

KT. BIMA 333

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME		QUAY	TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END	minutes	minutes	minutes	minutes		minutes	minutes	minutes	minutes
Sunday, 01 October 2017	1	UNI FORTUNA	RD	ICT	23.34	01.20	00.09	01.06		52	56	108			30	35	65
	2	CURUG MAS	JS	RD	01.40	02.00	01.49	01.59	20	10	10	20			25	35	60
	3	MITRA PROGRES 3	BU	RD	02.00	02.57	02.04	02.25		26	21	47			5	35	40
	4	CAPE FULMAR	RD	TL	03.44	05.13	04.14	04.47	47	44	33	77			115	45	160
	5	TELUK BERAU	BT	RD	08.04	08.32	08.22	08.28	167	22	5	27		140	25	35	60
	6	NAVIGATOR ARIES	AKR	RD	09.43	10.36	09.55	10.17	71	34	22	56			55	35	90
	7	TANTO DAMAI	RD	MRH	10.59		11.13	11.49	23	14	36	50			40	55	95
	8	SINAR BELAWAN	RD	TL		13.12	12.20	12.48		55	28	83			5	45	50
	9	CAPE FULMAR	TL	RD	13.40		14.10	14.21	28	30	11	41			65	35	100
	10	ORIENTAL DIAMOND	RD	NT		16.10	14.42	15.45		21	57	78			35	60	95
	11	MENTARI SENTOSA	BB	RD	17.06	18.06	17.18	17.43	56	35	35	70		60	15	55	70
	12	TANTO RAYA	BB	RD	19.03	19.31	19.12	19.25	57	18	13	31		175	70	35	105
	13	BEETHOVEN	RD	ICT	22.15		22.32	23.09	149	17	37	54		125	30	40	70
	14	OLYMPIA	RD	ICT		00.29	23.46	00.29		37	43	80			70	40	110
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME		QUAY	TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END	minutes	minutes	minutes	minutes		minutes	minutes	minutes	minutes
Monday, 02 October 2017	1	KANG MAY	RD	NT	00.29	01.48	00.37	01.35		21	28	49			40	60	100
	2	GUNTHER SCHULTE	RD	ICT	03.09		03.35	04.15	120	26	40	66			100	60	160
	3	STRAIT MAS	RD	TL		05.29	04.32	05.03	17	43	31	74			10	45	55
	4	LEAP HEART	JU	RD	06.54	07.54	07.19	07.34	111	45	15	60			170	60	230
	5	MERATUS GORONTALO	RD	NT	09.28	11.10	10.17	11.04	66	169	47	216		50	30	45	75
	6	LIDYA	RD	ICT	11.38		12.00	12.29	28	22	29	51			55	40	95
	7	TELUK FLAMINGGO	RD	BB		13.54	13.13	13.45		53	32	85			70	35	105
	8	FLORES SEA	RD	TL	15.13	17.00	15.53	16.36	73	64	43	107		35	100	50	150
	9	MERATUS MEDAN I	RD	NT	18.24		18.57	19.35	88	33	38	71		60	30	35	65
	10	HONGKONG BRIDGE	RD	TL		21.16	20.06	20.40		67	34	101			75	45	120
	11	BONNY STAR	RD	BT	22.46	23.46	23.00	23.37	90	23	37	60		40	80	40	120
	12																
	13																
	14																
	15																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Tuesday, 03 October 2017	1	TANTO DAMAI	MRH	RD	00.53	01.36	01.10	01.30	67	23	20	43		15	30	35	65
	2	OLYMPIA	ICT	RD	02.10	03.37	03.04	03.22	34	69	16	85			75	40	115
	3	FATIMA III	BT	RD	05.03	05.50	05.26	05.43	86	30	17	47			95	35	130
	4	MERATUS BENOA	MRH	RD	06.40	07.46	07.02	07.20	50	48	18	66			70	35	105
	5	MERATUS KARIMATA	BU	RD	07.58		08.11	08.32	12	13	21	34			35	35	70
	6	NIRBITA	RD	SNP			09.16	09.54		44	38	82			35	40	75
	7	MERATUS MEDAN I	NT	BT		12.13	10.17	11.50		46	33	79			20	90	110
	8	LUZON	RD	BB	12.20	13.27	12.45	13.24	7	28	39	67			60	40	100
	9	NRS V	RD	JU	13.48	14.41	13.59	14.30	21	22	31	53			30	40	70
	10	MUTIARA PERSADA 3	RD	JU	15.08		15.24	15.53	27	16	29	45			35	35	70
	11	KOTA NABIL	BT	RD		16.56	16.16	16.33		23	17	40			35	35	70
	12	ISA EXPRESS	JS	RD	17.14	18.12	17.50	18.04	18	32	14	46			25	35	60
	13	PAC SCHEDAR	RD	JB	18.33		18.56	19.58	21	23	62	85			60	45	105
	14	MERATUS BONTANG	RD	NT			20.10	20.49		12	39	51			30	35	65
	15	SENDANG MAS	RD	TL			21.14	22.04		25	50	75			30	60	90
	16	MILA UTAMA	RD	JU		23.12	22.41	23.01		48	20	68			60	40	100
	17																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Wednesday, 04 October 201	1	SPIL CAYA	RD	BT	01.19	02.54	01.57	02.44	79	48	47	95		70	85	60	145
	2	DOBONSOLO	JU	RD	06.24		06.40	06.46	186	16	6	22		120	40	35	75
	3	TB. AS PERFECT 2	NT	RD		07.30	06.58	07.13		19	15	34			10	35	45
	4	TANTO SENANG	RD	BB	07.53		09.12	09.42	23	75	30	105			85	45	130
	5	GIOVANNI BOTTIGUER	JU	RD			09.59	10.34		17	35	52			15	40	55
	6	PRATAMA I	RD	NT			10.43	11.35		9	52	61			20	45	65
	7	MUARA MAS	ICT	RD			11.56	12.16		21	20	41			10	35	45
	8	BONNY STAR	BT	RD			12.40	13.33		24	53	77			15	60	75
	9	SINAR AMBON	BT	RD			14.27	14.37		54	10	64			25	35	60
	10	WARNOW CHIEF	RD	ICT		15.54	14.54	15.21		17	27	44			50	40	90
	11	MUTIARA PERSADA 3	RD	JU	16.57		17.27	17.55	96	30	27	57		30	40	40	80
	12	DONGGALA VIII	RD	BB		19.07	18.24	19.04		29	36	65			25	40	65
	13	TEAM OSCO	RD	JU	19.40		19.58	20.33	36	18	35	53			50	45	95
	14	MERATUS MEDAN I	BT	RD		23.13	20.47	21.30		103	43	146			75	40	115
	15																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME		QUAY	TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END	minutes	minutes	minutes	minutes		minutes	minutes	minutes	minutes
Thursday, 05 October 2017	1	GRIYA AMBON	SMP	RD	00.12		00.38	00.56	59	26	18	44		70	50	35	85
	2	LOGISTIK NUSANTARA	RD	JS		02.40	01.51	02.27		55	36	91			75	45	120
	3	TENG HONG	RD	JU	04.14		04.33	05.26	94	19	53	72		35	45	60	105
	4	BUMI INDONESIA	RD	JU			05.44	05.55		18	11	29			25	40	65
	5	SENDANG MAS	TL	RD			07.35	07.56		100	21	121			65	40	105
	6	MERATUS KARIANGAU	NT	RD			08.38	09.00		42	22	64			10	35	45
	7	MERATUS KUPANG	RD	BT			09.49	10.22		49	33	82			40	40	80
	8	DHARMA KARTIKA IX	JU	RD			10.47	10.55		25	8	33			5	35	40
	9	WARNOW CHIEF	ICT	RD			11.06	12.03		11	57	68			10	50	60
	10	LOUDS ISLAND	RD	ICT		13.11	12.20	12.55		17	35	52			15	35	50
	11	TB SEMPATI	RD	NT	13.57		14.23	15.10	46	26	47	73			80	50	130
	12	LEO PRADANA	ICT	RD		16.41	15.53	16.22		43	29	72			80	40	120
	13	SERASI I	RD	MRH	19.36	20.43	20.00	20.26	175	24	26	50		110	90	40	130
TOTAL																	
					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME		QUAY	TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END	minutes	minutes	minutes	minutes		minutes	minutes	minutes	minutes
Friday, 06 October 2017	1	TANTO BERKAT	RD	BU	00.17		00.45	01.25	214	28	35	63		170	50	40	90
	2	TANTO SELALU	RD	BB			01.48	02.39		23	53	76			25	60	85
	3	ORIENTAL EMERALD	RD	ICT		03.30	02.49	03.09		31	20	51			50	35	85
	4	SAMUDRA MAS	RD	BB	04.29		05.05	05.57	59	36	52	88		20	40	55	95
	5	NAVIGATOR ARIES	AKR	RD			07.11	07.29		74	18	92			55	35	90
	6	TB SEMPATI	NT	RD			07.44	08.13		15	28	43			10	35	45
	7	MEGA 07	RD	NT			08.18	08.58		5	40	45			5	35	40
	8	CSCL KINGSTON	ICT	RD			09.18	09.35		20	17	37			10	35	45
	9	KEDUNG MAS	RD	BB			09.41	10.30		6	49	55			5	40	45
	10	MERATUS KUPANG	BT	RD			10.54	11.14		24	20	44			5	35	40
	11	MULTI SPIRIT	RD	MRH		14.10	11.38	13.38		24	120	144			120	60	180
	12	SPIL CITRA	RD	BT	15.20		16.13	16.56	70	53	46	99		70	45	55	100
	13	PRATIWI RAYA	TL	RD			19.07	19.19		124	12	136			110	35	145
	14	SOPHIA	MRH	RD		20.27	20.07	20.16		59	9	68			60	35	95
	15																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Saturday, 07 October 2017	1	MENTARI KRISTAL	TL	RD	00.33	02.11	00.56	01.34	213	60	38	98		180	100	50	150
	2	ANGGRAINI EXCELLENT	RD	SMP	03.45	04.58	03.58	04.25	89	33	27	60		45	85	35	120
	3	BBC NEWYORK	RD	JU	06.30		07.05	07.39	91	35	33	68		75	30	40	70
	4	SPIL HANA	RD	BU			07.54	08.12		15	18	33			10	40	50
	5	SPRING MAS	BT	RD			08.37	09.15		25	38	63			5	45	50
	6	TB. ANTASENA	RD	NT			09.33	10.07		18	34	52			25	60	85
	7	SINAR SABANG	RD	ICT			11.20	11.48		73	28	101			25	40	65
	8	SINGAPORE PIONER	AKR	RD		12.24	12.07	12.17		18	19	37			10	35	45
	9	KUNIANG	JU	RD	13.33		13.42	14.07	69	9	25	34			65	35	100
	10	Ict IRIS MANDIRI	RD	TL			14.28	15.20		21	52	73			15	45	60
	11	SEASPAN SANTOS	RD	ICT			16.03	16.55		43	52	95			55	60	115
	12	TB. ANTASENA	NT	RD		17.46	17.11	17.33		29	22	51			40	35	75
	13	MULTI SPIRIT	MRH	RD	18.19		20.50	21.12	33	151	22	173		120	30	35	65
	14	INTREPRID SEAHAWK	SMP	RD			21.38	22.01		26	23	49			25	35	60
	15	MENTARI KRISTAL	MRH	RD		00.32	00.01	00.18		123	17	140			110	35	145
	16																
	17																
TOTAL																	
					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME		QUAY	TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END	minutes	minutes	minutes	minutes		minutes	minutes	minutes	minutes
Sunday, 08 October 2017	1	KEDUNG MAS	BB	RD	03.45	04.35	03.48	04.29	193	3	41	44		150	30	45	75
	2	TANTO ABADI	MRH	RD	05.54		06.05	06.17	79	11	12	23			90	35	125
	3	IRIS MANDIRI	TL	RD		07.38	07.00	07.17		43	17	60			25	35	60
	4	SPIL CITRA	BT	RD	08.33		08.56	09.14	65	23	18	41			75	45	120
	5	ANGGRAINI EXCELLENT	SMP	RD			09.59	10.09		45	10	55			15	35	50
	6	ORIENTAL EMERALD	ICT	RD			10.38	10.56		29	18	47			10	35	45
	7	OOCL NORFOLK	TL	RD			11.24	11.49		28	25	53			20	35	55
	8	MAGELAN	NT	RD		15.06	13.46	14.20		117	34	151			100	60	160
	9	MUTIARA PERSADA 3	RD	JU	15.41	16.40	15.54	16.31	35	22	37	59			75	40	115
	10	KURAU	RD	SMP	17.24		17.35	18.23	44	11	48	59			65	45	110
	11	ORIENTAL GOLD	RD	BT			19.10	19.51		47	41	88			45	55	100
	12	HANTON TRADER 1	JU	RD			20.27	21.20		36	53	89			15	35	50
	13	BBC NEWYORK	JS	RD			21.29	22.10		9	41	50			5	35	40
	14	TANTO SELALU	BB	RD		23.41	22.20	22.41		70	21	91			70	35	105
	15																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME		QUAY	TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END	minutes	minutes	minutes	minutes		minutes	minutes	minutes	minutes
Monday, 09 October 2017	1	AS COSTANTINA	RD	ICT	23.41	03.00	01.37	02.32		84	55	139		75	75	75	150
	2	INTAN JAYA	RD	JS	06.39		06.43	07.33	219	4	50	54		180	15	45	60
	3	LUMOSO SELAMAT	MRH	RD			08.08	08.15		35	7	42			5	35	40
	4	MENTARI PERKASA	BT	RD			08.23	08.35		8	12	20			5	30	35
	5	GH LESTE	RD	ICT		11.45	08.43	09.43		130	60	190			25	55	80
	6	SITU MAS	RD	TL	12.39		13.21	13.51	54	42	30	72			195	55	250
	7	MARINA STAR 2	RD	TL		15.27	14.11	14.48		39	37	76			15	55	70
	8	KAMILA	RD	NT	16.35	18.29	17.20	18.20	68	34	60	94			145	55	200
	9	TOMINI DIGNITY	RD	JU	19.01	21.07	19.34	20.45	32	55	71	126			70	75	145
	10	NIKI BAROKAH	RD	DU	21.40	22.51	22.12	22.28	37	55	16	71			120	15	135
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Tuesday, 10 October 2017	1	MERATUS SABANG	MRH	RD	00.53		01.20	01.28	122	27	8	35		90	30	35	65
	2	RED ROVER	MRH	RD			01.45	02.06		27	21	48			10	35	45
	3	MERATUS KENDARI I	NT	RD		03.21	02.40	03.06		49	26	75			10	45	55
	4	SPIL HAPSRI	RD	BT	05.56		06.16	06.36	155	20	20	40			150	35	185
	5	OCEAN SUKSES	RD	BGSR			06.49	07.38		13	49	62			25	55	80
	6	AS SHOUMIA	RD	ICT		09.55	08.00	08.30		107	30	137			15	40	55
	7	MULIA KARSA I	MRH	RD	10.47		10.57	11.06	52	10	9	19			145	35	180
	8	TIMUR LAUT MAS	RD	NT			11.57	12.44		51	47	98			35	35	70
	9	HIJAU SEJUK	ICT	BT		14.05	13.10	13.47		44	37	81			25	40	65
	10	AYER MAS	RD	RD	15.14	16.06	15.35	15.49	69	38	14	52			85	45	130
	11	MENTARI SEJAHTERA	RD	JS	16.34		17.24	18.41	28	50	77	127			80	80	160
	12	TIGER SUMMER	RD	AKR			19.03	19.41		22	38	60			20	45	65
	13	LAGUN MAS	RD	ICT			20.03	20.26		22	23	45			25	35	60
	14	MERATUS BENOA	RD	MRH		22.35	21.30	22.20		79	50	129			60	45	105
	15																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Wednesday, 11 October 201	1	PULAU HOKI	ICT	RD	23.55	00.53	00.14	00.26	80	46	12	58		70	85	35	120
	2	KAMILIA	NT	RD	03.13	03.51	03.24	03.40	150	22	16	38		50	75	15	90
	3	HS CHOPIN	RD	ICT	05.36		06.20	06.49	108	44	29	73		80	40	60	100
	4	WARNOW CHIEF	RD	ICT			07.46	08.23		57	37	94			40	45	85
	5	KGM HOTEL	RD	JS		09.18	08.32	09.06		21	34	55			5	55	60
	6	HIJAU SEJUK	BT	RD	09.43		09.53	10.12	85	10	19	29			25	35	60
	7	LAGUN MAS	ICT	RD			11.14	11.27		62	13	75			40	35	75
	8	AYER MAS	RD	ICT			12.13	12.36		46	23	69			30	35	65
	9	HAPPY STAR I	RD	JS		14.18	13.30	13.55		77	25	102			30	45	75
	10	MARINA STAR 2	RD	NT	14.39	15.53	15.06	15.44	21	30	38	68			100	35	135
	11	FRISIA NUERNRBERG	RD	ICT	17.58	19.25	18.26	19.00	125	53	34	87		85	40	40	80
	12	ORIENTAL MUTIARA	RD	BT	20.50		21.18	21.50	85	28	32	60			135	50	185
	13	PALUNG MAS	RD	TL		23.41	22.29	23.12		68	43	111			65	50	115
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Thursday, 12 October 2017	1	RELIANCE	RD	MRH	00.16		01.11	01.59	35	55	48	103		15	60	45	105
	2	KANAL MAS	BT	RD		02.52	02.08	02.40		21	32	53			10	40	50
	3	AYER MAS	ICT	RD	03.46		04.04	04.16	54	18	12	30			55	35	90
	4	ATLANTIK STAR 6	RD	SU			04.30	05.25		14	55	69			20	40	60
	5	FRISIA NORDBERG	ICT	RD			06.11	06.26		46	15	61			30	35	65
	6	EVER ABLE	ICT	RD			06.30	06.41		4	11	15			5	25	30
	7	MSC LUCIA	ICT	RD			06.50	07.20		9	30	39			5	35	40
	8	CSCL KINGSTONE	RD	ICT			07.33	08.05		13	32	45			5	45	50
	9	WARNOW CHIEF	ICT	RD		09.25	08.34	09.04		50	30	80			35	60	95
	10	NORD PLUTO	RD	TL	12.22		12.57	13.46	177	35	49	84		150	60	45	105
	11	ASIA PESONA	RD	BT		15.15	14.18	15.03		44	45	89			35	40	75
	12	PULAU HOKI	NT	RD	17.00	17.38	17.14	17.27	95	25	13	38			120	35	155
	13	SINAR JEPARA	BT	RD	19.28		20.06	20.19	110	38	13	51			135	35	170
	14	MENTARI SEJAHTERA	JS	RD		00.42	22.43	23.48		78	55	133			45	50	95
	15																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Friday, 13 October 2017	1	MUNDU	RD	SMP	00.52	02.41	01.51	02.17	10	83	26	109			100	40	140
	2	MERATUS KARIMATA	RD	BB	03.54		04.37	05.13	73	43	33	76			140	35	175
	3	KIRANA	RD	JU		06.36	06.03	06.24		62	21	83			45	35	80
	4	SINAR SUMBA	RD	ICT	07.11		07.54	08.26	35	43	32	75			75	35	110
	5	FATIMA III	RD	BB		09.36	08.42	09.25		27	43	70			20	45	65
	6	SOPHIA	NT	RD	10.45		10.53	11.18	67	8	25	33			80	35	115
	7	ORIENTAL GALAXY	RD	BT		13.59	12.12	13.45		68	93	161			45	95	140
	8	MERATUS SABANG	RD	ICT	14.49		15.30	16.03	50	41	33	74			40	40	80
	9	HOSANA VII	RD	NT			16.06	16.49		3	43	46			5	40	45
	10	TOMINI DIGNITY	JU	RD			17.40	18.19		51	39	90			50	40	90
	11	SPIL NIRMALA	RD	BT			18.45	19.22		26	37	63			30	40	70
	12	MUTIARA PERSADA 3	JU	RD		20.12	19.37	19.48		39	45	84			5	35	40
	13	MERATUS SABANG	ICT	MRH	22.17	23.39	22.39	23.24	125	37	45	82			165	55	220
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Saturday, 14 October 2017	1	MAHAKAMAH I	RD	SMP	23.50	01.22	00.16	00.57	11	51	41	92		80	75	45	120
	2	FATIMA III	BB	RD	03.28	04.57	03.40	04.31	126	38	51	89		38	75	45	120
	3	INTAN DAYA 17	JS	RD	05.41		06.39	06.55	44	58	16	74			37	35	72
	4	MENTARI TRADER	JS	RD		07.44	07.11	07.22		38	11	49			5	35	40
	5	Tb. LLB SUKSES 08	RD	NT	08.00	09.29	08.27	09.18	16	38	51	89			50	50	100
	6	SINAR SUMBA	ICT	RD	09.47	11.04	10.17	10.46	18	48	29	77		25	95	40	135
	7	WAN HAI 216	ICT	RD	12.50		13.14	13.32	106	24	18	42			50	40	90
	8	TANTO SEMANGAT	TL	RD		15.30	14.43	15.02		99	19	118			55	90	145
	9	MARTINE	RD	NT	16.00		16.37	17.28	30	37	51	88			55	55	110
	10	LEGUNDI	JU	RD			18.24	18.40		56	16	72			40	35	75
	11	ORIENTAL GALAXY	BT	RD			19.00	19.42		20	42	62			35	35	70
	12	PASIFIC 88	BT	RD			20.06	20.43		22	37	59			20	35	55
	13	LUNA BLUE	JU	RD			20.50	21.09		7	19	26			20	55	75
	14	PULAU NUNUKAN	RD	NT			21.48	22.35		38	47	85			35	35	70
	15	NORD PLUTO	TL	RD			23.02	23.24		27	22	49			25	35	60
	16	TANTO SEPAKAT	RD	BT		00.30	23.28	00.18		16	50	66			5	40	45
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Sunday, 15 October 2017	1	DEVA	RD	ICT	00.30	02.30	00.50	01.50		60	60	120		100	60	60	120
	2	SINAR AMBON	BB	RD	04.30	06.00	04.49	05.12	120	68	23	91		60	70	40	110
	3	DONG HAE STAR	RD	TL	07.10		08.06	08.49	70	56	43	99			60	45	105
	4	SUMBER 5	RD	DER70		12.00	09.41	11.02		110	91	201			125	40	165
	5	KITRAN 31	RD	SMLNG	17.20		18.21	19.10	320	59	49	108			75	55	130
	6	SMB II	RD	PDS			20.10	20.57		60	47	107			60	50	110
	7	GENCO LOIRE	RD	WILMAR			21.05	22.11		8	66	74			15	60	75
	8	RORO PRAYESTI	RD	MSP		00.20	23.25	00.20		74	55	129			60	60	120
TOTAL																	
					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Monday, 16 October 2017	1	GRESIK - SURABAYA	GRE	SBY	00.20		00.20	01.16		56		56					0
	2	FLORES SEA	RD	TL		03.10	01.59	02.44		69	45	114		25	45	120	165
	3	NORD VILAN	RD	JU	03.55	05.53	04.45	05.31	45	72	46	118			45	150	195
	4	SERASI I	MRH	RD	06.49	07.56	07.15	07.30	56	52	15	67			35	95	130
	5	SINAR SABANG	ICT	RD	08.40		09.12	09.44	44	32	32	64			35	5	40
	6	SAVIOUR	RD	BB		10.44	09.51	10.30		21	39	60			40	175	215
	7	NAJADE	ICT	RD	12.40	14.33	13.17	14.04	116	66	47	113			45	40	85
	8	HIJAU JELITA	RD	NT	15.00		15.31	16.09	27	31	38	69			80	50	130
	9	ORIENTAL EMERALD	RD	BB			16.29	17.13		20	44	64			15	50	65
	10	NAVIGATOR ARIES	RD	AKR			18.06	19.15		53	59	112			55	60	115
	11	CSCL SANTIAGO	RD	ICT			20.19	21.12		64	53	117			75	45	120
	12	KOTA NASRAT	RD	ICT			21.40	22.38		28	58	86			35	40	75
	13	MERATUS BANJAR 1	BB	RD		00.45	22.50	00.14		43	24	67			35	115	150
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Tuesday, 17 October 2017	1	NORTHERN VIVACITY	ICT	RD	05.30		06.05	06.40	285	35	35	70		225	35	35	70
	2	GULF MAS	RD	TL			06.58	08.26		18	88	106			20	35	55
	3	TRIFOSA	RD	NT			08.31	09.19		5	48	53			55	50	105
	4	MULTI SPIRIT	RD	MRH			09.50	10.30		31	40	71			40	35	75
	5	MENTARI SELARAS	RD	BT		11.40	10.40	11.15		35	35	70			10	35	45
	6	KOTA NASTRAT	ICT	RD	12.44	14.00	13.06	13.39	64	43	33	76			40	40	80
	7	NAVIGATOR ARIES	AKR	RD	15.50		16.20	16.32		30	12	42			155	35	190
	8	MUTIA LADJONI 7	RD	DOCK		18.43	17.24	18.10		85	46	131			35	35	70
	9	NORD VILAN	JU	RD	19.42	20.51	20.18	20.31	59	56	13	69			110	35	145
	10	TANTO HANDAL	RD	MRH	22.35	00.05	23.08	00.05	44	33	57	90			140	70	210
	16																
	17																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Wednesday, 18 October 201	1	MSC GIANNA	RD	ICT	00.05		00.26	00.59			33	33			30	40	70
	2	TANTO SUBUR 2	RD	NT			01.33	02.05		34	32	66			15	45	60
	3	MARTINE	NT	RD		02.55	02.15	02.39		26	19	45			5	35	40
	4	ALIDRA	ICT	RD	03.15		03.43	04.07	20	28	24	52			40	40	80
	5	STAR HIDRA	RD	JU			04.30	05.25		23	55	78			15	60	75
	6	MERATUS BONTANG	TL	RD			06.23	06.29		58	6	64			35	35	70
	7	RED ROCK	RD	MRH			07.33	08.01		64	28	92			50	35	85
	8	MERATUS KARIANGAU	RD	BU			08.25	08.49		24	24	48			25	35	60
	9	ARGO	RD	JS			09.19	09.53		30	34	64			20	40	60
	10	MENTARI SELARAS	BT	RD		12.00	11.37	11.44		120	7	127			90	35	125
	11	TANTO SUBUR 2	NT	RD	14.00		14.16	14.41	120	16	25	41			125	35	160
	12	KISIK MAS	ICT	RD			15.15	15.40		34	25	59			40	35	75
	13	TANTO SENTOSA	RD	BU		17.00	16.10	16.47		43	37	80			15	45	60
	14	SINAR MOROTAI	RD	AKR	17.27		17.58	18.36	27	31	38	69			70	35	105
	15	SINAR BELAWAN	TL	RD			19.48	20.41		72	53	125			60	60	120
	16	SINAR MOROTAI	TL	RD			20.48	21.07		7	18	25			25	35	60
	17	MSC GIANNA	ICT	RD			21.25	21.47		18	23	41			10	35	45
	18	LINTAS BATANG HARI	RD	BB		23.45	22.36	23.35		59	59	118			30	60	90
TOTAL																	

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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Thursday, 19 October 2017	1	WARNOW CHIEF	ICT	RD	00.00		00.37	01.05	15	37	28	65			20	40	60
	2	SENDANG MAS	RD	TL		03.58	02.25	03.23		115	58	173			90	60	150
	3	MENTAYA RIVER	MRH	RD	04.32	05.50	05.14	05.29	34	63	15	78			100	35	135
	4	SERENA III	RD	SMP	06.27		07.06	07.48	37	39	42	81			90	35	125
	5	KGM GOLF	RD	JS			08.45	09.33		57	48	105			50	60	110
	6	NORTHERN DEMOCRAT	RD	ICT			10.25	11.05		52	50	102		45	40	45	85
	7	UNI AMPLE	ICT	RD		11.44	11.10	11.21		28	11	39			5	35	40
	8	GRIYA DAYAK	RD	BT	14.00		14.44	15.06	136	44	22	66			35	35	70
	9	STRAIT MAS	TL	RD			15.42	16.20		32	38	70			35	35	70
	10	SINAR AMBON	BT	RD			17.07	17.40		47	33	80			40	40	80
	11	CURUG MAS	RD	JS			17.52	18.22		12	30	42			10	35	45
	12	UMSINI	JU	RD			18.48	19.05		26	17	43			5	35	40
	13	TB. GLOBAL MANDIRI V	RD	NT			19.17	19.35		12	18	30			10	45	55
	14	NAVIGATOR GLOBAL	RD	AKR			20.19	21.13		44	44	88			15	60	75
	15	BINTANG JIASIA 35	RD	RD		01.24	22.52	00.50		133	58	191			90	100	190
TOTAL																	

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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Friday, 20 October 2017	1	HIJAU TERANG	RD	BB	03.00	05.18	03.43	04.59	96	62	16	78		180	45	75	120
	2	MITRA SEJATRAH	RD	BT	06.11		06.51	07.33	53	40	42	82			120	35	155
	3	LAGUN MAS	RD	BT			08.14	08.41		41	21	62			35	20	55
	4	SENDANG MAS	TL	RO			09.24	10.08		43	44	87			30	60	90
	5	PALUNG MAS	RD	TL			10.11	10.36		4	25	29			40	45	85
	6	SELATAN DAMAI	RD	ICT		11.42	10.48	11.14		40	26	66			15	55	70
	7	WAN HAI 216	RD	ICT	12.45	14.21	13.25	14.04	63	57	39	96			115	50	165
	8	MUTIARA PERSADA 3	RD	JU	15.42		16.25	17.19	81	43	54	97			150	40	190
	9	MUARA MAS	RD	BT			17.30	17.51		11	21	32			5	35	40
	10	SURYA PEKIK	BB	RD			18.22	19.21		31	59	90			20	65	85
	11	MENTARI	RD	BB		20.10	19.30	19.58		21	28	49			5	40	45
	12	GUNUNG DEMPO	RD	JU	20.27	22.55	20.47	21.07	17	128	20	148		75	35	35	70
	13	HIJAU TERANG	BB	RD	23.15	00.20	23.45	00.20	20	30	35	65			145	35	180
TOTAL																	

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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Saturday, 21 October 2017	1	KOTA JUTA	RD	ICT	00.20	02.32	00.38	01.34		76	56	132		10	30	40	70
	2	MILA UTAMA	JU	RD	04.36		04.58	05.36	124	22	38	60			200	40	240
	3	MUTIARA PERSADA III	JU	RD			05.40	06.11		4	31	35			20	15	35
	4	MERATUS PALEMBANG	NT	RD		07.34	06.32	07.12		43	40	83			25	40	65
	5	TANTO TANGGUH	TL	RD	08.57		09.30	09.38	83	33	8	41			100	35	135
	6	INTAN DAYA 88	TL	RD			09.49	10.19		11	30	41			25	35	60
	7	SINAR SABANG	RD	ICT			10.54	11.14		25	20	45			10	35	45
	8	NEW LIFE	JU	RD			11.34	11.48		30	14	44			10	35	45
	9	ISA EXPRESS	RD	TL			14.25	15.13		157	48	205			130	60	190
	10	PALUNG MAS	TL	RD			15.33	15.59		20	26	46			10	35	45
	11	CPO NORFOLK	RD	ICT		17.00	16.04	16.42		23	38	61			10	40	50
	12	LINTAS BARITO	RD	BB	18.31	20.00	19.05	19.28	91	66	23	89		180	130	35	165
	13	CIREMAI	JU	RD	23.39	00.11	23.53	00.00	219	25	7	32			55	35	90
TOTAL																	

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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Sunday, 22 October	1	KIRANA IX	RD	JU	00.11		00.47	01.09		36	22	58			40	35	75
	2	TANTO RAYA	BB	RD		02.16	01.24	01.59		32	25	57		165	20	35	55
	3	TANTO TANGGUH	TL	RD	05.50		06.19	06.55	214	29	36	65			50	45	95
	4	SANTIKA NUSANTARA	JU	RD		08.55	07.11	07.20		111	9	120		110	15	35	50
	5	PRATIWI RAYA	TL	RD	10.20	12.00	11.11	11.29	85	82	18	100			50	35	85
	6	KMTC NHAVA SHEVA	TL	RD	12.20	13.58	13.00	13.22	20	66	22	88			75	35	110
	7	MERATUS BATAM	RD	RNT	15.10		15.57	16.56	72	47	59	106		60	40	45	85
	8	SPIL CAYA	RD	BT			17.22	18.44		26	82	108			25	85	110
	9	SINAR SABANG	K.306	RD		21.50	20.36	21.12		150	36	186			115	35	150
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Monday, 23 October 2017	1	EASTGATE	RD	JU	01.23	03.45	02.17	03.06		93	39	132		210	105	50	155
	2	NORTHERN DIAMOND	RD	ICT	05.00		05.45	06.26	75	45	41	86		75	30	60	90
	3	GUNUNG DEMPO	RD	JU		07.58	07.02	07.32		62	30	92			35	35	70
	4	COUGAR	ICT	RD	11.53	13.39	12.39	13.00	182	85	21	106		220	40	35	75
	5	SAWU SEA	RD	TL	14.00		14.37	15.21	21	37	42	79			60	60	120
	6	KANAL MAS	ICT	RD		16.52	16.11	16.27		64	16	80			55	35	90
	7	CSCL SAN JOSE	RD	TL	17.20	19.24	17.56	18.37	28	83	41	124			70	50	120
	8	KABOGA BARU II	BT	RD	19.40		19.57	20.32	16	17	35	52			75	40	115
	9	PEDHOULAS FARMER	JU	RD			20.46	21.35		14	49	63			10	45	55
	10	Tb. GLOBAL MANDIRI	NT	RD		23.20	22.07	22.26		86	19	105			25	35	60
	11	SURABAYA-GRESIK			23.20	23.50				30		30			30		30
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Tuesday, 24 October 2017	1	TRUONG MINH DRAGON	RDU	RD	00.00		00.19	00.41	40	19	22	41			10	35	45
	2	SICHEM MELBOURNE	RD	DNBN		03.15	01.39	02.56		77	17	94		25	65	70	135
	3	SANGGAU	MSP	RD	04.40		05.18	05.47	85	38	29	67			60	35	95
	4	MERATUS BONTANG	RD	TL			06.44	07.27		57	43	100			70	35	105
	5	DARYA LOK	RD	TL		09.45	07.51	09.16		53	17	70			20	85	105
	6	MUARA MAS	ICT	RD	10.55		11.19	11.41	70	24	22	46			115	35	150
	7	SAWU SEA	TL	RD			12.22	12.46		41	24	65			20	35	55
	8	MERATUS SABANG	RD	ICT		14.56	13.40	14.11		99	31	130		25	65	35	100
	9	MERATUS GORONTALO	RD	BB	15.35		16.10	17.00	39	35	50	85			45	40	85
	10	NORTHERN DIAMOND	ICT	RD			18.02	18.32		62	30	92			55	40	95
	11	LABOBAR	RD	JU			19.27	19.53		55	26	81			50	35	85
	12	XONNE	RD	PETRO		23.22	21.52	22.56		85	64	149			20	160	180
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Wednesday, 25 October 2017	1	BERKAH 36	PDU	RD	00.21		01.03	01.32	59	42	28	70			60	40	100
	2	ASIA GLORY	RD	PDU			01.41	02.46		9	65	74			30	80	110
	3	CAPE MORETON	RD	TL		06.20	04.51	05.36		159	45	204			125	45	170
	4	MERATUS SABANG	RD	MRH	06.45	08.40	07.32	08.20	25	67	48	115		25	85	50	135
	5	SMB II	PDS	RD	10.10		11.37	11.45	80	87	8	95		60	70	35	105
	6	HUMMING BIRD	MASPION	RD			12.08	12.38		23	30	53			15	35	50
	7	Tb. PRIME 16	RD	PETRO			12.57	13.17		19	20	39			15	35	50
	8	VEGA STAR	PL	RD			14.27	14.49		70	22	92			50	35	85
	9	PORADO	RD	PDU			14.57	15.21		8	24	32			10	35	45
	10	PUPUK INDONESIA	RD	PDS			16.11	17.22		50	61	111			45	85	130
	11	THOR INFINITY	RD	PETRO			17.50	18.27		28	37	65			5	45	50
	12	RORO PRYASTI	RD	MASPION			18.46	19.18		19	32	51			10	40	50
	13	ASIKE GLOBAL	MASPION	RD			19.35	19.57		17	22	39			10	35	45
	14	TUNAS BARU	RD	MSP			20.02	20.19		5	16	21			5	35	40
	15	HAMBURG PEARL	PETRO	RD			20.40	21.08		21	28	49			5	35	40
	16	MARINA 1611	RD	SMLTING		22.25	21.35	22.02		50	27	77			70	35	105
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Thursday, 26 October 2017	1	TIGER ZHEJIANG	RD	KLM	00.23		01.42	02.17		79	35	114		45	95	60	155
	2	MERATUS KAPUAS	RD	NT		05.00	03.43	04.17	77	129	34	163			105	40	145
	3	NAVIGATOR ARIES	AKR	RD	06.17		06.36	06.52		19	16	35		40	30	40	70
	4	SUNGAI MAS	RD	TL			07.25	08.05		33	40	73			10	60	70
	5	MERATUS PEKANBARU	RD	TL			08.12	08.47		7	35	42			10	40	50
	6	FELYA	RD	JS		11.05	10.17	10.43		53	26	79			80	40	120
	7	LYOLIA	ICT	RD	11.40	12.52	12.08	12.34	35	46	26	72			70	95	165
	8	VALERIE SCHULTE	RD	ICT	13.34		14.05	14.36	42	21	31	52			20	40	60
	9	MITRA PROGRESS III	RD	BT		16.15	15.00	15.49		50	49	99			55	45	100
	10	MENTARI SUCCESS	BB	RD	18.10	19.41	18.36	19.18	105	49	42	91		115	30	40	70
	11	ORIENTAL GALAXY	BT	RD	20.44		21.25	21.59	63	41	29	70			125	40	165
	12	PELANGI MAS	RD	TL			22.22	22.43		23	21	44			10	35	45
	13	AS MARINE	RD	NT		00.15	23.22	00.03		51	41	92			50	50	100
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Friday, 27 October 2017	1	DARYA LOK	TL	RD	00.15		00.39	01.07		24	28	52			10	35	45
	2	SPIL NINGSIH	BT	RD			01.49	02.30		42	41	83			30	45	75
	3	PRATIWI RAYA	TL	RD		04.43	03.42	04.08		107	26	133			75	35	110
	4	MERATUS KAPUAS	NT	RD	05.22		05.39	06.36	39	17	57	74			80	55	135
	5	KURAU	RD	SMP			07.13	07.52		37	39	76			30	40	70
	6	SEMPATI	RD	NT			08.14	09.42		22	35	57			5	25	30
	7	TIGA RODA	RD	NT		11.34	10.03	10.52		63	49	112			45	50	95
	8	MAIDEN ENERGY	RD	SMP	12.00	14.14	12.32	13.35	26	71	63	134			105	60	165
	9	MUTIARA PERSADA 3	RD	JU	14.52		15.32	16.17	38	40	45	85			105	50	155
	10	ANTHOS	NT	RD			17.22	17.47		65	25	90			50	35	85
	11	WAN HAI 212	RD	ICT			17.58	18.29		11	31	42			15	35	50
	12	HARRY 06	RD	DOCK		20.31	19.01	20.02		61	61	122			25	60	85
	13	SINAR SUMBA	RD	ICT	21.20		21.53	22.28	49	33	35	68			110	40	150
	14	OCEAN HIRYU	RD	NT		00.34	23.14	00.00		80	46	126			45	60	105
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Saturday, 28 October 2017	1	TANTO SEMANGAT	RD	TL	01.31	03.30	02.15	02.50	57	83	35	118		75	115	45	160
	2	MUTIARA PERSADA 3	JU	RD	03.59	05.20	04.24	04.58	29	47	34	81			100	35	135
	3	SUNGAI MAS	TL	RD	06.34	08.35	07.16	08.04	73	73	48	121			135	60	195
	4	MERATUS BENOA	MRH	RD	09.14		10.07	10.14	39	53	7	60			90	35	125
	5	MERATUS BANJAR I	NT	RD			10.57	11.52		43	55	98			25	70	95
	6	AYER MAS	BB	RD			12.19	12.58		27	39	66			35	40	75
	7	MSC GIANNA	ICT	RD		15.00	14.20	14.34		48	14	62			40	50	90
	8	RORO SAWITRI	RD	JS	16.17	18.00	17.05	17.38	77	70	33	103			40	40	80
	9	SINAR SUMBA	ICT	RD	19.10	21.00	19.45	20.30	70	65	45	110			125	50	175
	10	KURAU	SMDR	RD	21.41		22.37	22.57	41	56	20	76			100	35	135
	11	TANTO LUAS	RD	BB		00.04	23.25	00.04		28	39	67			50	40	90
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Monday, 29 October 2017	1	HIJAU TERANG	BT	RD	00.04	01.24	00.35	00.51		64	16	80			0	35	35
	2	NAVIGATOR GLOBAL	RD	AKR	02.03	03.57	02.55	03.39	39	70	44	114			100	60	160
	3	PULAU WETAR	RD	NT	06.39	08.19	07.25	08.05	162	35	40	75			220	40	260
	4	FATIMA III	RD	BT	09.26	10.57	09.58	10.42	67	47	44	91			115	45	160
	5	MERATUS BATAM	RD	NT	12.05		12.38	13.07	68	33	29	62			105	40	145
	6	MAIDEN ENERGY	SMPR	RD			13.27	13.42		20	15	35			15	35	50
	7	GH ZONDA	ICT	RD			14.24	15.00		42	36	78			30	45	75
	8	HONGKONG BRIDGE	TL	RD			15.31	15.51		31	20	51			15	35	50
	9	TANTO SEMANGAT	TL	RD			16.05	16.18		14	13	27			5	35	40
	10	URU BHUM	RD	ICT		17.39	16.38	17.17		44	39	83			15	40	55
	11	SPEETRUM W	RD	ICT	18.59		19.36	20.18	80	37	32	69			110	45	155
	12	ARMADA SEJATI	RD	BB			20.45	21.30		37	45	82			30	45	75
	13	LAGUN MAS	RD	ICT			22.24	22.44		54	20	74			30	45	75
	14	ASIA PESONA	BB	RD		00.33	23.18	23.52		76	34	110			45	30	75
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Sunday, 30 October 2017	1	SURYA INDAH JAYA	RD	NT	00.33		00.33	00.51			18	18			30	50	80
	2	OCEAN HIRYU	BGSR	RD			01.25	01.59		34	29	63			35	35	70
	3	MERATUS GORONTALO	RD	BT		03.30	02.15	02.51		25	36	61		90	45	45	90
	4	TELUK BERAU	RD	BT	05.00		05.34	06.08	80	34	34	68			30	30	60
	5	Tb. CLUMENT I	RD	NT			07.13	07.30		65	17	82			60	30	90
	6	SURABAYA - GRESIK					07.30	09.44		134		134					0
	7	PANGEMPANG	RD	MSP			10.18	10.43		34	25	59			150	45	195
	8	TIGER ZHEJIANG	K.MRG	RD			11.11	11.48		28	37	65			25	35	60
	9	Tb. SEMAR SATU	RD	PTR			11.52	12.14		4	22	26			30	55	85
	10	GRESIK - SURABAYA					12.34	14.03		89		89					0
	11	SINAR PAPUA	RD	NT			14.25	14.50		22	25	47			80	40	120
	12	ARMADA SEJATI	BB	RD		15.44	15.02	15.20		36	18	54			5	35	40
	13	SEGARA MAS	RD	TL	16.51		17.33	18.11	67	42	38	80			100	55	155
	14	URU BHUM	ICT	RD		19.31	18.35	19.09		46	24	70			30	45	75
	15	TIGA RODA	NT	RD	21.41		22.23	22.57	70	42	34	76			180	35	215
	16	AS CONSTANTINA	RD	ICT		00.27	23.46	00.27		49	41	90			55	45	100
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Tuesday, 31 October 2017	1	DARWIN	RD	TL	00.27	02.39	00.52	01.55		59	64	123			30	60	90
	2	MITRA KENDARI	BT	RD	03.19		03.40	03.56	40	21	16	37			90	35	125
	3	DIA CHENG	JU	RD			04.48	05.13		52	25	77			35	25	60
	4	AS SAVONIA	RD	ICT			06.06	06.32		49	26	75			35	45	80
	5	INTAN DAYA 12	RD	JS			06.52	07.32		20	40	60			25	45	70
	6	TANTO SUBUR II	NT	RD		09.00	07.53	08.37		44	44	88			35	40	75
	7	SURYA PEKIK	RD	BT	11.00	12.47	11.35	12.21	120	61	46	107		120	70	45	115
	8	MERATUS KARIANGAU	NT	RD	15.40	16.50	16.19	16.34	173	55	15	70		150	30	35	65
	9	TR ATHOS	RD	ICT	18.20		19.01	19.41	90	41	40	81			145	45	190
	10	MENTAYA RIVER	MRH	RD			21.51	22.13		130	22	152			105	60	165
	11	AS CONSTANTINA	ICT	RD			22.55	23.30		42	35	77			25	35	60
	12	AS SAVONIA	ICT	RD		00.17	23.34	00.17		4	43	47			25	45	70
TOTAL																	

ATTACHMENT 1
FUEL ESTIMATION (AIS WORKING HOUR)

KT. BIMA 333

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			L	L	L					
Sunday, 01 October 2017	1	UNI FORTUNA	32.72	76.0	10.223	9.950	6.857	6.827	35.005	34.954	48.294	48.241	200.351	235.71		20.56	20.56					
	2	CURUG MAS	9.01	25	1.966	1.914	1.270	1.264	2.455	2.448	3.020	3.014	17.351	20.41	2.23	3.81	6.03					
	3	MITRA PROGRES 3	11.18	25	5.112	4.975	2.984	2.971	5.768	5.753	7.097	7.084	41.744	49.11		8.95	8.95					
	4	CAPE FULMAR	23.88	47.0	8.651	8.419	4.889	4.868	16.132	16.102	20.738	20.710	100.508	118.24	5.23	14.66	19.89					
	5	TELUK BERAU	9.81	25	4.325	4.210	1.714	1.707	3.314	3.305	4.077	4.069	26.721	31.44	18.59	5.14	23.73					
	6	NAVIGATOR ARIES	21.70	40.6	6.684	6.506	3.556	3.540	10.320	10.299	13.156	13.138	67.199	79.06	7.91	10.66	18.57					
	7	TANTO DAMAI	14.04	20.9	2.752	2.679	3.175	3.161	5.321	5.306	6.438	6.426	35.258	41.48	2.56	9.52	12.08					
	8	SINAR BELAWAN	16.24	26.1	10.813	10.524	5.270	5.247	10.535	10.508	13.007	12.985	78.889	92.81		15.80	15.80					
	9	CAPE FULMAR	23.46	45.7	5.898	5.741	2.603	2.592	8.386	8.371	10.765	10.751	55.107	64.83	3.12	7.81	10.92					
	10	ORIENTAL DIAMOND	27.21	57.3	4.129	4.018	4.952	4.931	19.530	19.497	25.355	25.324	107.736	126.75		14.85	14.85					
	11	MENTARI SENTOSA	11.74	25	6.881	6.697	4.444	4.425	8.591	8.568	10.569	10.551	60.727	71.44	6.24	13.33	19.56					
	12	TANTO RAYA	12.14	25	3.539	3.444	1.968	1.960	3.805	3.795	4.681	4.672	27.863	32.78	6.35	5.90	12.25					
	13	BEETHOVEN	37.91	90	3.342	3.253	3.429	3.414	20.488	20.461	27.055	27.026	108.467	127.61	16.59	10.28	26.87					
	14	OLYMPIA	42.39	90	7.274	7.080	5.079	5.057	30.353	30.312	40.081	40.039	165.276	194.44		15.23	15.23					
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1093.1982	1286.1155			225.2974	1284.701	1511.4129	1940	428.58709	22.092118

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Monday, 02 October 2017	1	KANG MAY	42.60	90	4.128657	4.018373	3.111126	3.097561	18.591	18.566	24.54975	24.52384	100.58665	118.33724		9.33	9.328375					
	2	GUNTHER SCHULTE	52.57	90	5.11167	4.975129	4.190496	4.172225	25.041	25.007	33.06701	33.03211	134.59731	158.34978	13.361	12.56	25.92575					
	3	STRAIT MAS	23.58	46.1	8.453916	8.228097	4.698435	4.677949	15.242	15.214	19.57356	19.54743	95.635121	112.51191	1.8928083	14.09	15.980558					
	4	LEAP HEART	22.01	41.5	8.847122	8.6108	3.809542	3.792932	11.264	11.242	14.37796	14.35789	76.301919	89.766964	12.358925	11.42	23.781425					
	5	MERATUS GORONTALO	28.86	62.7	33.22586	32.33834	13.71435	13.65456	58.694	58.601	76.50214	76.41149	363.14116	427.22489	7.34855	41.12	48.46955					
	6	LIDYA	50.19	90	4.325259	4.209724	3.238111	3.223992	19.350	19.324	25.55178	25.52481	104.74765	123.23253	3.1175667	9.71	12.826692					
	7	TELUK FLAMINGGO	14.25	21.4	10.41994	10.14161	5.396851	5.37332	9.207	9.181	11.16396	11.14235	72.025674	84.736087		16.18	16.181875					
	8	FLORES SEA	15.20	23.5	12.58257	12.24647	6.793683	6.764062	12.518	12.484	15.31902	15.29088	93.998954	110.587	8.1279417	20.37	28.498067					
	9	MERATUS MEDAN I	23.93	47.1	6.487889	6.314586	4.507958	4.488303	14.915	14.888	19.17669	19.15132	89.929332	105.79921	9.7980667	13.52	23.314692					
	10	HONGKONG BRIDGE	46.76	90	13.17238	12.82052	6.412729	6.384769	38.321	38.269	50.60254	50.54914	216.53172	254.7432		19.23	19.227875					
	11	BONNY STAR	15.83	25.1	4.521862	4.401075	3.809542	3.792932	7.376	7.357	9.076208	9.060071	49.394346	58.110995	10.02075	11.42	21.44325					
	12																					
	13																					
	14																					
	15																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1396.8898	1643.3998			244.97811	1605.1212	1888.3779	2054	165.62209	8.063393

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Tuesday, 03 October 2017	1	TANTO DAMAI	30.74	69.1	4.521862	4.401075	2.730172	2.718268	12.762	12.743	16.69891	16.67977	73.254524	86.181793	7.4598917	8.19	15.646017					
	2	OLYMPIA	44.26	90	13.56559	13.20323	5.396851	5.37332	32.250	32.207	42.5863	42.54135	187.12326	220.14501	3.7856167	16.18	19.967492					
	3	FATIMA III	19.27	33.8	5.898081	5.740533	2.984141	2.97113	7.410	7.394	9.335559	9.321264	51.054673	60.064321	9.5753833	8.95	18.523008					
	4	MERATUS BENOA	14.67	22.3	9.43693	9.184853	4.190496	4.172225	7.401	7.380	9.011762	8.994733	59.77175	70.319706	5.5670833	12.56	18.131833					
	5	MERATUS KARIMATA	16.63	27.0	2.555835	2.487564	2.15874	2.149328	4.446	4.435	5.505873	5.496459	29.234051	34.393001	1.3361	6.47	7.80885					
	6	NIRBITA	41.26	90	8.650519	8.419448	5.206374	5.183674	31.112	31.070	41.08325	41.03989	171.76484	202.07629		15.61	15.61075					
	7	MERATUS MEDAN I	30.98	69.9	9.043724	8.802151	5.015897	4.994027	23.708	23.672	31.03637	31.00094	137.27355	161.49829		15.04	15.039625					
	8	LUZON	33.27	78.0	5.504876	5.357831	4.253989	4.235441	22.232	22.201	29.22055	29.18836	122.19411	143.75778	0.7793917	12.76	13.534517					
	9	NRS V	13.49	25	4.325259	4.209724	3.365095	3.350423	6.505	6.488	8.002483	7.98824	44.233322	52.039202	2.338175	10.09	12.42805					
	10	MUTIARA PERSADA 3	28.94	63.0	3.145643	3.061618	2.857157	2.844699	12.277	12.257	16.0045	15.98557	68.433108	80.509539	3.006225	8.57	11.5731					
	11	KOTA NABIL	45.76	90	4.521862	4.401075	2.539695	2.528621	15.176	15.156	20.04061	20.01946	84.383853	99.275121		7.62	7.615					
	12	ISA EXPRESS	58.88	90	6.291286	6.123235	2.920649	2.907915	17.453	17.429	23.0467	23.02238	99.194574	116.6995	2.00415	8.76	10.7614					
	13	PAC SCHEDAR	40.12	90	4.521862	4.401075	5.396851	5.37332	32.250	32.207	42.5863	42.54135	169.27738	199.14986	2.338175	16.18	18.52005					
	14	MERATUS BONTANG	13.57	25	2.359232	2.296213	3.238111	3.223992	6.259	6.243	7.700503	7.686797	39.006677	45.890208		9.71	9.709125					
	15	SENDANG MAS	58.73	90	4.915068	4.783778	4.761928	4.741165	28.456	28.418	37.57614	37.53649	151.18806	177.86831		14.28	14.278125					
	16	MILA UTAMA	18.18	31.0	9.43693	9.184853	4.317481	4.298656	9.946	9.923	12.44982	12.42992	71.986546	84.690054		12.95	12.9455					
	17																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1559.3743	1834.558			222.09244	1748.1529	2056.6504	2240	183.34958	8.1852492

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Wednesday, 04 October 2017	1	SPIL CAYA	65.58	90	9.43693	9.184853	6.031775	6.005476	36.044	35.996	47.59645	47.54622	197.84146	232.75465	8.7959917	18.09	26.881617					
	2	DOBONSOLO	26.42	54.8	3.145643	3.061618	1.396832	1.390742	5.291	5.282	6.855252	6.846715	33.270241	39.14146	20.70955	4.19	24.8978					
	3	TB. AS PERFECT 2	3.46	25	3.735451	3.635671	2.15874	2.149328	4.173	4.162	5.133669	5.124531	30.271943	35.61405		6.47	6.47275					
	4	TANTO SENANG	26.59	55.4	14.7452	14.35133	6.666699	6.637631	25.477	25.434	33.0231	32.98213	159.31719	187.43198	2.5608583	19.99	22.550233					
	5	GIOVANNI BOTTIGUER	58.61	90	3.342246	3.252969	3.301603	3.287208	19.729	19.703	26.05279	26.0253	104.6944	123.16989		9.90	9.8995					
	6	PRATAMA I	3.35	25	1.769424	1.72216	3.873034	3.856148	7.486	7.467	9.210405	9.194012	44.578351	52.445119		11.61	11.612875					
	7	MUARA MAS	16.28	26.2	4.128657	4.018373	2.603187	2.591837	5.220	5.206	6.446537	6.435328	36.649643	43.117227		7.81	7.805375					
	8	BONNY STAR	17.71	29.7	4.718465	4.592426	4.888912	4.867596	10.891	10.865	13.59159	13.56944	67.985177	79.982561		14.66	14.658875					
	9	SINAR AMBON	31.39	71.3	10.61655	10.33296	4.063511	4.045794	19.563	19.534	25.62915	25.60009	119.3844	140.45223		12.18	12.184					
	10	WARNOW CHIEF	54.78	90	3.342246	3.252969	2.793664	2.781483	16.694	16.672	22.04467	22.02141	89.602221	105.41438		8.38	8.3765					
	11	MUTIARA PERSADA 3	33.14	77.5	5.898081	5.740533	3.619065	3.603285	18.813	18.786	24.72094	24.69365	105.87399	124.55764	10.6888	10.85	21.540175					
	12	DONGGALA VIII	19.38	34.1	5.701478	5.549182	4.127004	4.10901	10.322	10.299	13.01132	12.99147	66.110284	77.776805		12.37	12.374375					
	13	TEAM OSCO	33.24	77.9	3.538849	3.44432	3.365095	3.350423	17.568	17.543	23.08944	23.06399	94.963537	111.72181	4.0083	10.09	14.098175					
	14	MERATUS MEDAN I	28.39	61.2	20.25008	19.70916	9.269886	9.229468	38.775	38.712	50.48499	50.42463	236.85489	278.65281		27.79	27.79475					
	15																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1387.3977	1632.2326			221.147	1575.3727	1853.3796	1880	26.620381	1.4159777

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Thursday, 05 October 2017	1	GRIYA AMBON	41.30	90	5.11167	4.975129	2.793664	2.781483	16.694	16.672	22.04467	22.02141	93.093806	109.52212	6.5691583	8.38	14.945658						
	2	LOGISTIK NUSANTARA	25.83	53.0	10.81315	10.52431	5.777805	5.752614	21.220	21.183	27.44713	27.41249	130.13085	153.09512		17.32	17.324125						
	3	TENG HONG	28.35	61.0	3.735451	3.635671	4.57145	4.551518	19.084	19.053	24.84554	24.81581	104.29301	122.69766	10.466117	13.71	24.173117						
	4	BUMI INDONESIA	16.82	27.5	3.538849	3.44432	1.841279	1.83325	3.844	3.834	4.766751	4.758669	27.860906	32.777536		5.52	5.520875						
	5	SENDANG MAS	73.88	90	19.66027	19.13511	7.682576	7.64908	45.909	45.847	60.62285	60.55887	267.06465	314.1937		23.04	23.035375						
	6	MERATUS KARIANGAU	19.61	34.8	8.257313	8.036746	4.063511	4.045794	10.324	10.301	13.03038	13.01068	71.069432	83.611096		12.18	12.184						
	7	MERATUS KUPANG	17.00	27.9	9.633532	9.376204	5.206374	5.183674	11.016	10.989	13.67923	13.65623	78.739296	92.634466		15.61	15.61075						
	8	DHARMA KARTIKA IX	68.67	90	4.915068	4.783778	2.095248	2.086113	12.521	12.504	16.5335	16.51605	71.9541	84.651883		6.28	6.282375						
	9	WARNOW CHIEF	46.67	90	2.16263	2.104862	4.317481	4.298656	25.800	25.765	34.06904	34.03308	132.55105	155.94241		12.95	12.9455						
	10	LOUDS ISLAND	63.85	90	3.342246	3.252969	3.301603	3.287208	19.729	19.703	26.05279	26.0253	104.6944	123.16989		9.90	9.8995						
	11	TB SEMPATI	5.15	25	5.11167	4.975129	4.634943	4.614734	8.959	8.936	11.02229	11.00267	59.256208	69.713186	5.1217167	13.90	19.019092						
	12	LEO PRADANA	63.59	90	8.453916	8.228097	4.57145	4.551518	27.318	27.281	36.0731	36.03503	152.51166	179.42548		13.71	13.707						
	13	SERASI I	21.07	38.8	4.718465	4.592426	3.174618	3.160777	8.859	8.841	11.26173	11.24554	55.852818	65.709198	19.484792	9.52	29.003542						
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL													1349.0722	1587.1437			203.65091	1522.1755	1790.7947	1874	83.205342	4.4399862	

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Friday, 06 October 2017	1	TANTO BERKAT	32.18	74.1	5.504876	5.357831	4.000019	3.982579	19.944	19.915	26.16581	26.13651	111.00702	130.5965	23.827117	11.99	35.820742						
	2	TANTO SELALU	23.38	45.5	4.521862	4.401075	4.82542	4.804381	15.471	15.442	19.85331	19.82666	89.146135	104.87781		14.47	14.4685						
	3	ORIENTAL EMERALD	43.02	90	6.094684	5.931884	3.238111	3.223992	19.350	19.324	25.55178	25.52481	108.23923	127.34028		9.71	9.709125						
	4	SAMUDRA MAS	32.41	74.9	7.077697	6.88864	5.587328	5.562967	28.139	28.098	36.93107	36.88986	155.17424	182.55793	6.5691583	16.75	23.322158						
	5	NAVIGATOR ARIES	50.21	90	14.5486	14.15998	5.841298	5.815829	34.906	34.859	46.0934	46.04476	202.26869	237.96316		17.51	17.5145						
	6	TB SEMPATI	5.42	25	2.949041	2.870267	2.730172	2.718268	5.277	5.263	6.492581	6.481025	34.78211	40.920129		8.19	8.186125						
	7	MEGA 07	4.61	25	0.983014	0.956756	2.857157	2.844699	5.523	5.508	6.794561	6.782468	32.249679	37.940799		8.57	8.566875						
	8	CSCL KINGSTON	66.30	90	3.932054	3.827022	2.349218	2.338975	14.038	14.019	18.53756	18.518	77.560423	91.247556		7.04	7.043875						
	9	KEDUNG MAS	16.81	27.5	1.179616	1.148107	3.49208	3.476854	7.288	7.270	9.038062	9.022736	41.915364	49.312193		10.47	10.470625						
	10	MERATUS KUPANG	40.22	90	4.718465	4.592426	2.793664	2.781483	16.694	16.672	22.04467	22.02141	92.317898	108.60929		8.38	8.3765						
	11	MULTI SPIRIT	15.03	23.1	4.718465	4.592426	9.142901	9.103037	16.617	16.571	20.30231	20.26468	101.31145	119.18994		27.41	27.414						
	12	SPIL CITRA	72.13	90	10.41994	10.14161	6.285744	6.258338	37.562	37.511	49.60051	49.54816	207.32732	243.91449	7.7939167	18.85	26.641042						
	13	PRATIWI RAYA	18.04	30.6	24.37873	23.72754	8.634962	8.597313	19.697	19.651	24.63399	24.59439	153.91523	181.07674		25.89	25.891						
	14	SOPHIA	30.31	67.6	11.59956	11.28971	4.317481	4.298656	19.787	19.757	25.86954	25.83968	122.75848	144.42174		12.95	12.9455						
	15																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL													1529.9733	1799.9685			236.37057	1730.8882	2036.3391	1920	-116.33911	-6.0593285	

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Saturday, 07 October 2017	1	MENTARI KRISTAL	23.12	44.7	11.79616	11.48107	6.222252	6.195122	19.655	19.618	25.19883	25.16477	125.33162	151.00195	23.715775	18.66	42.372525				
	2	ANGGRAINI EXCELLENT	27.58	58.5	6.487889	6.314586	3.809542	3.792932	15.308	15.282	19.89211	19.86794	90.755084	109.34347	9.9094083	11.42	21.331908				
	3	BBC NEWYORK	39.62	90	6.881095	6.697289	4.317481	4.298656	25.800	25.765	34.06904	34.03308	141.86194	166.8964	10.132092	12.95	23.077592				
	4	SPIL HANA	17.84	30.1	2.949041	2.870267	2.095248	2.086113	4.711	4.700	5.88453	5.874992	31.171833	36.672745		6.28	6.282375				
	5	SPRING MAS	51.26	90	4.915068	4.783778	4.000019	3.982579	23.903	23.871	31.56396	31.53065	128.54979	151.23504		11.99	11.993625				
	6	TB. ANTASENA	8.36	25	3.538849	3.44432	3.301603	3.287208	6.382	6.365	7.851493	7.837518	42.007953	49.421121		9.90	9.8995				
	7	SINAR SABANG	70.63	90	14.352	13.96863	6.412729	6.384769	38.321	38.269	50.60254	50.54914	218.85944	257.48169		19.23	19.227875				
	8	SINGAPORE PIONER	27.38	57.9	3.538849	3.44432	2.349218	2.338975	9.344	9.329	12.13682	12.12201	54.603514	64.239428		7.04	7.043875				
	9	KUNIANG	59.05	90	1.769424	1.72216	2.15874	2.149328	12.900	12.883	17.03452	17.01654	67.633362	79.568661	7.682575	6.47	14.155325				
	10	Ict IRIS MANDIRI	13.59	25	4.128657	4.018373	4.634943	4.614734	8.959	8.936	11.02229	11.00267	57.316439	67.431105		13.90	13.897375				
	11	SEASPAN SANTOS	106.29	90	8.453916	8.228097	6.031775	6.005476	36.044	35.996	47.59645	47.54622	195.90169	230.47257		18.09	18.085625				
	12	TB. ANTASENA	8.36	25	5.701478	5.549182	3.238111	3.223992	6.259	6.243	7.700503	7.686797	45.601891	53.649284		9.71	9.709125				
	13	MULTI SPIRIT	29.91	66.3	29.68701	28.89402	10.98418	10.93629	49.426	49.350	64.56783	64.49278	308.33755	362.75006	3.674275	32.93	36.60915				
	14	INTREPRID SEAHAWK	51.95	90	5.11167	4.975129	3.111126	3.097561	18.591	18.566	24.54975	24.52384	102.52642	120.61932		9.33	9.328375				
	15	MENTARI KRISTAL	19.90	35.5	24.18213	23.53619	8.888931	8.850175	23.010	22.961	29.08648	29.04296	169.55813	199.48015		26.65	26.6525				
	16																				
	17																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1780.0167	2100.263			205.96232	1955.0846	2306.2253	2020	-286.22533	-14.169571

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Sunday, 08 October 2017	1	KEDUNG MAS	15.17	23.5	0.589808	0.574053	2.793664	2.781483	5.135	5.121	6.281936	6.270379	29.547015	34.761194	21.488942	8.38	29.865442				
	2	TANTO ABADI	47.54	90	2.16263	2.104862	1.460324	1.453957	8.726	8.715	11.52335	11.51119	47.657518	56.067668	8.7959917	4.38	13.174617				
	3	IRIS MANDIRI	12.37	25	8.453916	8.228097	3.809542	3.792932	7.364	7.344	9.059415	9.04329	57.095226	67.170855		11.42	11.4225				
	4	SPIL CITRA	64.82	90	4.521862	4.401075	2.603187	2.591837	15.556	15.535	20.54163	20.51995	86.270376	101.49456	7.2372083	7.81	15.042583				
	5	ANGGRAINI EXCELLENT	24.99	50.4	8.847122	8.6108	3.49208	3.476854	12.257	12.235	15.81336	15.793	80.524551	94.734766		10.47	10.470625				
	6	ORIENTAL EMERALD	28.60	61.9	5.701478	5.549182	2.984141	2.97113	12.611	12.591	16.42728	16.40772	75.242238	88.52028		8.95	8.947625				
	7	OOCL NORFOLK	101.10	90	5.504876	5.357831	3.365095	3.350423	20.109	20.082	26.55381	26.52578	110.84842	130.4099		10.09	10.089875				
	8	MAGELAN	26.27	54.3	23.00252	22.38808	9.587347	9.545546	36.023	35.961	46.65046	46.59216	229.74969	270.29376		28.75	28.746625				
	9	MUTIARA PERSADA 3	34.67	83.0	4.325259	4.209724	3.74605	3.729716	20.761	20.732	27.34498	27.31543	112.1643	131.958	3.8969583	11.23	15.129083				
	10	KURAU	25.19	51.0	2.16263	2.104862	3.74605	3.729716	13.290	13.266	17.15662	17.13464	72.590273	85.400322	4.8990333	11.23	16.131158				
	11	ORIENTAL GOLD	31.27	70.9	9.240327	8.993502	5.587328	5.562967	26.753	26.712	35.04058	35.00078	152.89047	179.87114		16.75	16.753				
	12	HANTON TRADER 1	51.81	90	7.077697	6.88864	5.650821	5.626182	33.768	33.722	44.59036	44.5433	181.86687	213.96103		16.94	16.943375				
	13	BBC NEWYORK	37.56	90	1.769424	1.72216	3.174618	3.160777	18.971	18.945	25.05076	25.02433	97.817728	115.07968		9.52	9.51875				
	14	TANTO SELALU	21.07	38.8	13.76219	13.39458	5.777805	5.752614	16.126	16.093	20.50102	20.47154	111.87924	131.62264		17.32	17.324125				
	15																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1446.1439	1701.3458			219.55938	1632.7694	1920.9052	1960	39.094823	1.9946338

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Monday, 09 October 2017	1	AS COSTANTINA	68.23	90	16.51463	16.07349	8.825439	8.786959	52.738	52.667	69.64112	69.56762	294.8148	346.84094	0	26.46	26.462125						
	2	INTAN JAYA	9.71	25	0.786411	0.765404	3.428588	3.413639	6.627	6.610	8.153474	8.138961	37.923707	45.691213	24.383825	10.28	34.664075						
	3	LUMOSO SELAMAT	18.85	32.7	6.881095	6.697289	2.666679	2.655052	6.437	6.422	8.089908	8.077322	47.926215	57.742427	0	8.00	7.99575						
	4	MENTARI PERKASA	12.10	25	1.572822	1.530809	1.269847	1.264311	2.455	2.448	3.019805	3.01443	16.574701	19.96952	0	3.81	3.8075						
	5	GH LESTE	60.74	90	25.55835	24.87564	12.06355	12.01095	72.088	71.991	95.1929	95.09244	408.87334	492.61848	0	36.17	36.17125						
	6	SITU MAS	48.81	90	8.257313	8.036746	4.57145	4.551518	27.318	27.281	36.0731	36.03503	152.12371	183.28157	6.01245	13.71	19.71945						
	7	MARINA STAR 2	28.98	63.1	7.667505	7.462693	4.82542	4.804381	20.770	20.737	27.07935	27.04734	120.39438	145.05346	0	14.47	14.4685						
	8	KAMILA	11.66	25	6.684492	6.505937	5.968282	5.94226	11.536	11.506	14.19308	14.16782	76.504463	92.174052	7.5712333	17.90	25.466483						
	9	TOMINI DIGNITY	57.48	90	10.81315	10.52431	8.000038	7.965157	47.806	47.742	63.12792	63.0613	259.03934	312.09559	3.5629333	23.99	27.550183						
	10	NIKI BAROKAH	12.86	25	10.81315	10.52431	4.507958	4.488303	8.714	8.691	10.72031	10.70123	69.159761	83.325013	4.1196417	13.52	17.636267						
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL													1483.3344	1778.7923			213.94158	1665.1848	1992.7339	1920	-72.733867	-3.7882222	

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Tuesday, 10 October 2017	1	MERATUS SABANG	19.22	33.7	5.308273	5.16648	2.222233	2.212544	5.498	5.486	6.924333	6.913709	39.73122	46.742611	13.583683	6.66	20.246808						
	2	RED ROVER	28.04	60.0	5.308273	5.16648	3.047634	3.034346	12.533	12.512	16.30445	16.28482	74.190973	87.283498		9.14	9.138						
	3	MERATUS KENDARI I	16.04	25.6	9.633532	9.376204	4.761928	4.741165	9.370	9.346	11.55026	11.52993	70.309391	82.71693		14.28	14.278125						
	4	SPIL HAPSRI	14.80	22.6	3.932054	3.827022	2.539695	2.528621	4.532	4.519	5.524972	5.514605	32.917804	38.726828	17.257958	7.62	24.872958						
	5	OCEAN SUKSES	38.11	90	2.555835	2.487564	3.936527	3.919363	23.524	23.492	31.06295	31.03016	122.00782	143.53861		11.80	11.80325						
	6	AS SHOUMIA	19.26	33.8	21.03649	20.47457	8.698454	8.660528	21.580	21.532	27.18497	27.14332	156.31045	183.89465		26.08	26.081375						
	7	MULIA KARSA I	20.65	37.6	1.966027	1.913511	1.206355	1.201095	3.279	3.273	4.161008	4.154942	21.154996	24.888231	5.7897667	3.62	9.4068917						
	8	TIMUR LAUT MAS	24.08	47.6	10.02674	9.758906	6.222252	6.195122	20.767	20.729	26.71495	26.67976	127.09396	149.52231		18.66	18.65675						
	9	HIJAU SEJUK	17.70	29.7	8.650519	8.419448	5.142882	5.120458	11.448	11.421	14.28586	14.26257	78.751421	92.64873		15.42	15.420375						
	10	AYER MAS	8.01	25	7.470903	7.271342	3.301603	3.287208	6.382	6.365	7.851493	7.837518	49.767029	58.549446	7.682575	9.90	17.582075						
	11	MENTARI SEJAHTERA	16.76	27.3	9.830135	9.567555	8.063531	8.028373	16.762	16.720	20.77902	20.7437	110.49489	129.99398	3.1175667	24.18	27.295192						
	12	TIGER SUMMER	16.17	25.9	4.325259	4.209724	3.809542	3.792932	7.576	7.557	9.349561	9.33322	49.953662	58.769014		11.42	11.4225						
	13	LAGUN MAS	11.24	25	4.325259	4.209724	2.857157	2.844699	5.523	5.508	6.794561	6.782468	38.844893	45.699875		8.57	8.566875						
	14	MERATUS BENOA	10.20	25	15.53161	15.11674	8.190515	8.154804	15.832	15.790	19.47774	19.44307	117.53676	138.27854		24.56	24.558375						
	15																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL													1089.0653	1281.2533			239.32955	1292.4954	1520.5828	2120	599.4172	28.274396	

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Wednesday, 11 October 2017	1	PULAU HOKI	10.63	25	9.043724	8.802151	3.682557	3.666501	7.118	7.100	8.757435	8.741847	56.911981	66.955271	8.9073333	11.04	19.949083				
	2	KAMILIA	9.34	25	4.325259	4.209724	2.41271	2.40219	4.664	4.651	5.73763	5.727417	34.130019	40.152963	16.70125	7.23	23.9355				
	3	HS CHOPIN	36.25	88.9	8.650519	8.419448	4.634943	4.614734	27.377	27.340	36.13775	36.09948	153.27399	180.32234	12.0249	13.90	25.922275				
	4	WARNOW CHIEF	23.24	45.1	11.20635	10.90701	5.968282	5.94226	18.986	18.951	24.35228	24.31947	120.63285	141.92101	0	17.90	17.89525				
	5	KGM HOTEL	2.27	25	4.128657	4.018373	3.49208	3.476854	6.750	6.732	8.304464	8.289683	45.192475	53.167618	0	10.47	10.470625				
	6	HIJAU SEJUK	12.84	25	1.966027	1.913511	1.841279	1.83325	3.559	3.550	4.378717	4.370924	23.412591	27.544225	9.4640417	5.52	14.984917				
	7	LAGUN MAS	8.43	25	12.18937	11.86377	4.761928	4.741165	9.205	9.180	11.32427	11.30411	74.569652	87.729002	0	14.28	14.278125				
	8	AYER MAS	6.09	25	9.043724	8.802151	4.380973	4.361872	8.468	8.446	10.41833	10.39978	64.32107	75.671847	0	13.14	13.135875				
	9	HAPPY STAR I	10.60	25	15.13841	14.73403	6.476221	6.447984	12.518	12.485	15.40101	15.37359	98.574905	115.97048	0	19.42	19.41825				
	10	MARINA STAR 2	15.97	25.4	5.898081	5.740533	4.317481	4.298656	8.456	8.434	10.41799	10.3996	57.962329	68.190975	2.338175	12.95	15.283675				
	11	FRISIA NUERNRBERG	3.13	25	10.41994	10.14161	5.523836	5.499751	10.677	10.649	13.13615	13.11277	79.16071	93.130247	13.917708	16.56	30.480333				
	12	ORIENTAL MUTIARA	17.67	29.6	5.504876	5.357831	3.809542	3.792932	8.463	8.443	10.55837	10.54113	56.470372	66.435732	9.4640417	11.42	20.886542				
	13	PALUNG MAS	7.62	25	13.36898	13.01187	7.047653	7.016924	13.623	13.587	16.75992	16.73009	101.1453	118.99447	0	21.13	21.131625				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													864.61295	1017.1917			226.64045	1057.2573	1243.8322	2020	776.16785	38.424151

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Thursday, 12 October 2017	1	RELIANCE	7.43	25	10.81315	10.52431	6.539714	6.5112	12.641	12.608	15.552	15.52431	90.713475	106.72173	3.8969583	19.61	23.505583				
	2	KANAL MAS	8.10	25	4.128657	4.018373	3.365095	3.350423	6.505	6.488	8.002483	7.98824	43.845368	51.582786	0	10.09	10.089875				
	3	AYER MAS	6.36	25	3.538849	3.44432	1.904771	1.896466	3.682	3.672	4.529708	4.521645	27.189775	31.98797	6.01245	5.71	11.7237				
	4	ATLANTIK STAR 6	6.46	25	2.752438	2.678915	4.380973	4.361872	8.468	8.446	10.41833	10.39978	51.906548	61.066527	0	13.14	13.135875				
	5	FRISIA NORDBERG	23.27	45.2	9.043724	8.802151	3.873034	3.856148	12.341	12.317	15.8297	15.80839	81.870999	96.318823	0	11.61	11.612875				
	6	EVER ABLE	16.84	27.5	0.786411	0.765404	0.952386	0.948233	1.991	1.986	2.469534	2.465351	12.364413	14.546368	0	2.86	2.855625				
	7	MSC LUCIA	22.18	42.0	1.769424	1.72216	2.476202	2.465406	7.397	7.382	9.448433	9.435308	42.096275	49.52503	0	7.42	7.424625				
	8	CSCL KINGSTONE	24.78	49.7	2.555835	2.487564	2.857157	2.844699	9.914	9.896	12.78204	12.76549	56.102176	66.002561	0	8.57	8.566875				
	9	WARNOW CHIEF	20.03	35.9	9.830135	9.567555	5.079389	5.057243	13.261	13.233	16.77376	16.74878	89.55035	105.35335	0	15.23	15.23				
	10	NORD PLUTO	29.42	64.6	6.881095	6.697289	5.333359	5.310105	23.449	23.412	30.60085	30.56497	132.24841	155.58636	19.707475	15.99	35.698975				
	11	ASIA PESONA	7.48	25	8.650519	8.419448	5.650821	5.626182	10.923	10.894	13.43813	13.41421	77.016233	90.607333	0	16.94	16.943375				
	12	PULAU HOKI	10.74	25	4.915068	4.783778	2.41271	2.40219	4.664	4.651	5.73763	5.727417	35.29388	41.522212	10.577458	7.23	17.811708				
	13	SINAR JEPARA	8.89	25	7.470903	7.271342	3.238111	3.223992	6.259	6.243	7.700503	7.686797	49.093475	57.75703	12.247583	9.71	21.956708				
	14	MENTARI SEJAHTERA	5.93	25	15.33501	14.92539	8.444485	8.407666	16.323	16.280	20.0817	20.04596	119.84302	140.99179	0	25.32	25.319875				
	15																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													909.13439	1069.5699			221.87568	1097.7287	1291.4456	2060	768.55445	37.308468

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Friday, 13 October 2017	1	MUNDU	12.58	25	16.31802	15.88214	6.920668	6.890493	13.377	13.342	16.45794	16.42864	105.6175	124.25589	1.1134167	20.75	21.864292				
	2	MERATUS KARIMATA	9.53	25	8.453916	8.228097	4.82542	4.804381	9.327	9.303	11.47526	11.45483	67.872083	79.84951	8.1279417	14.47	22.596442				
	3	KIRANA	16.86	27.6	12.18937	11.86377	5.269866	5.246889	11.040	11.013	13.69683	13.67366	83.993989	98.816458	0	15.80	15.801125				
	4	SINAR SUMBA	26.93	56.4	8.453916	8.228097	4.761928	4.741165	18.516	18.485	24.02192	23.99233	111.20071	130.82436	3.8969583	14.28	18.175083				
	5	FATIMA III	11.16	25	5.308273	5.16648	4.444466	4.425087	8.591	8.568	10.56932	10.55051	57.623501	67.792354	0	13.33	13.32625				
	6	SOPHIA	10.45	25	1.572822	1.530809	2.095248	2.086113	4.050	4.039	4.982678	4.97381	25.330898	29.801056	7.4598917	6.28	13.742267				
	7	ORIENTAL GALAXY	22.39	42.6	13.36898	13.01187	10.22227	10.1777	30.924	30.864	39.53466	39.48008	187.58416	220.68725	0	30.65	30.650375				
	8	MERATUS SABANG	14.36	21.6	8.060711	7.845395	4.698435	4.677949	8.083	8.060	9.811634	9.792758	61.030454	71.800534	5.5670833	14.09	19.654833				
	9	HOSANA VII	3.13	25	0.589808	0.574053	2.920649	2.907915	5.645	5.631	6.945552	6.933189	32.147325	37.820382	0	8.76	8.75725				
	10	TOMINI DIGNITY	31.87	73.0	10.02674	9.758906	5.714313	5.689398	28.102	28.060	36.84782	36.80636	161.00567	189.41843	0	17.13	17.13375				
	11	SPIL NIRMALA	29.33	64.3	5.11167	4.975129	4.000019	3.982579	17.507	17.479	22.84193	22.8151	98.71259	116.13246	0	11.99	11.993625				
	12	MUTIARA PERSADA 3	16.60	26.9	7.667505	7.462693	5.333359	5.310105	10.953	10.926	13.56146	13.53824	74.752283	87.943863	0	15.99	15.9915				
	13	MERATUS SABANG	14.36	21.6	7.2743	7.079991	5.206374	5.183674	8.957	8.932	10.87235	10.85143	64.356946	75.714055	13.917708	15.61	29.528458				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1131.2281	1330.8566			239.21525	1334.5611	1570.0718	2266	695.92816	30.711746
					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Saturday, 14 October 2017	1	MAHAKAMAH I	32.39	74.8	10.02674	9.758906	5.841298	5.815829	29.391	29.348	38.57279	38.52973	167.28397	196.80467	1.2247583	17.51	18.739258				
	2	FATIMA III	11.06	25	7.470903	7.271342	5.650821	5.626182	10.923	10.894	13.43813	13.41421	74.68851	87.868836	14.02905	16.94	30.972425				
	3	INTAN DAYA 17	23.16	44.8	11.40296	11.09836	4.698435	4.677949	14.877	14.848	19.07513	19.04937	99.727186	117.3261	4.8990333	14.09	18.986783				
	4	MENTARI TRADER	10.46	25	7.470903	7.271342	3.111126	3.097561	6.014	5.998	7.398522	7.385354	47.746368	56.172198	0	9.33	9.328375				
	5	Tb. LLB SUKSES 08	3.41	25	7.470903	7.271342	5.650821	5.626182	10.923	10.894	13.43813	13.41421	74.68851	87.868836	1.7814667	16.94	18.724842				
	6	SINAR SUMBA	36.22	88.8	9.43693	9.184853	4.888912	4.867596	28.846	28.807	38.07549	38.03515	162.14205	190.75535	2.00415	14.66	16.663025				
	7	WAN HAI 216	29.89	66.2	4.718465	4.592426	2.666679	2.655052	11.987	11.969	15.65914	15.64093	69.888969	82.222316	11.802217	8.00	19.797967				
	8	TANTO SEMANGAT	22.92	44.1	19.46367	18.94376	7.492099	7.459433	23.387	23.343	29.96031	29.91958	159.96844	188.19817	0	22.46	22.46425				
	9	MARTINE	37.58	90	7.2743	7.079991	5.587328	5.562967	33.388	33.343	44.08934	44.04281	180.3683	212.19801	3.34025	16.75	20.09325				
	10	LEGUNDI	19.21	33.7	11.00975	10.71566	4.57145	4.551518	11.307	11.282	14.23995	14.21809	81.894909	96.346952	0	13.71	13.707				
	11	ORIENTAL GALAXY	29.93	66.3	3.932054	3.827022	3.936527	3.919363	17.725	17.697	23.15562	23.12871	97.321624	114.49603	0	11.80	11.80325				
	12	PASIFIC 88	21.97	41.4	4.325259	4.209724	3.74605	3.729716	11.054	11.033	14.10854	14.08883	66.29503	77.994153	0	11.23	11.232125				
	13	LUNA BLUE	17.38	28.9	1.376219	1.339458	1.650802	1.643604	3.592	3.583	4.472659	4.465265	22.123329	26.027446	0	4.95	4.94975				
	14	PULAU NUNUKAN	11.82	25	7.470903	7.271342	5.396851	5.37332	10.432	10.405	12.83417	12.81133	71.994296	84.699172	0	16.18	16.181875				
	15	NORD PLUTO	38.57	90	5.308273	5.16648	3.111126	3.097561	18.591	18.566	24.54975	24.52384	102.91437	121.07573	0	9.33	9.328375				
	16	TANTO SEPAKAT	14.25	21.3	3.145643	3.061618	4.190496	4.172225	7.146	7.126	8.664926	8.648155	46.155311	54.300366	0	12.56	12.56475				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1525.2012	1794.3543			255.5373	1742.4079	2049.8916	2146	96.108374	4.478489

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Sunday, 15 October 2017	1	DEVA	43.16	90	11.79616	11.48107	7.619084	7.585864	45.529	45.468	60.12183	60.05838	249.65997	293.71762	0	22.85	22.845				
	2	SINAR AMBON	24.77	49.7	13.36898	13.01187	5.777805	5.752614	20.033	19.998	25.82897	25.79553	129.56671	152.43142	13.361	17.32	30.685125				
	3	DONG HAE STAR	64.94	90	11.00975	10.71566	6.285744	6.258338	37.562	37.511	49.60051	49.54816	208.49118	245.28374	7.7939167	18.85	26.641042				
	4	SUMBER 5	2.71	25	21.6263	21.04862	12.76197	12.70632	24.668	24.604	30.34904	30.29502	178.05918	209.48139	0	38.27	38.265375				
	5	KITRAN 31	14.79	22.6	11.59956	11.28971	6.857176	6.827278	12.229	12.196	14.90904	14.88105	90.788767	106.81031	35.629333	20.56	56.189833				
	6	SMB II	21.17	39.1	11.79616	11.48107	6.793683	6.764062	19.074	19.036	24.25947	24.22469	123.42919	145.21082	0	20.37	20.370125				
	7	GENCO LOIRE	42.41	90	1.572822	1.530809	4.698435	4.677949	28.077	28.039	37.07513	37.036	142.70632	167.88979	0	14.09	14.08775				
	8	RORO PRAYESTI	30.90	69.6	14.5486	14.15998	8.190515	8.154804	38.565	38.507	50.47759	50.41989	223.02321	262.38024	0	24.56	24.558375				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1345.7245	1583.2053			233.64263	1544.3208	1816.848	1666	-150.84796	-9.0544991

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Monday, 16 October 2017	1	GRESIK - SURABAYA			26.21369	26.13576							52.349453	61.587592	0	10.66	10.661				
	2	FLORES SEA	26.06	53.7	13.56559	13.20323	7.23813	7.206571	26.908	26.862	34.82774	34.78402	164.59605	193.64241	0	21.70	21.70275				
	3	NORD VILAN	10.50	25	14.15539	13.77728	7.492099	7.459433	14.482	14.444	17.81685	17.78514	107.41199	126.36705	5.010375	22.46	27.474625				
	4	SERASI I	18.39	31.5	10.22334	9.950257	4.253989	4.235441	9.943	9.920	12.46197	12.44222	73.430144	86.388405	6.2351333	12.76	18.990258				
	5	SINAR SABANG	60.98	90	6.291286	6.123235	4.063511	4.045794	24.282	24.250	32.06498	32.03114	133.15199	156.6494	4.8990333	12.18	17.083033				
	6	SAVIOUR	17.63	29.5	4.128657	4.018373	3.809542	3.792932	8.440	8.420	10.52666	10.50945	53.644807	63.111538	0	11.42	11.4225				
	7	NAJADE	55.64	90	12.97578	12.62917	7.174637	7.143355	42.874	42.816	56.61472	56.55497	238.78204	280.92004	12.915633	21.51	34.428008				
	8	HIJAU JELITA	26.44	54.9	6.094684	5.931884	4.380973	4.361872	16.608	16.580	21.51848	21.49169	96.967988	114.07999	3.006225	13.14	16.1421				
	9	ORIENTAL EMERALD	25.81	52.9	3.932054	3.827022	4.063511	4.045794	14.906	14.880	19.2792	19.25486	84.188992	99.045873	0	12.18	12.184				
	10	NAVIGATOR ARIES	37.83	90	10.41994	10.14161	7.111145	7.08014	42.494	42.437	56.11371	56.05449	231.85211	272.76719	0	21.32	21.322				
	11	CSCL SANTIAGO	73.62	90	12.58257	12.24647	7.428607	7.396217	44.391	44.331	58.61878	58.55692	245.55222	288.88497	0	22.27	22.273875				
	12	KOTA NASRAT	60.89	90	5.504876	5.357831	5.460344	5.436536	32.629	32.585	43.08731	43.04184	173.10367	203.65138	0	16.37	16.37225				
	13	MERATUS BANJAR 1	13.86	20.4	8.453916	8.228097	4.253989	4.235441	7.019	6.998	8.474707	8.45792	56.121197	66.024938	0	12.76	12.755125				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1711.1527	2013.1208			242.81153	1917.5424	2255.9323	2174	-81.932293	-3.7687347

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Tuesday, 17 October 2017	1	NORTHERN VIVACITY	88.10	90	6.881095	6.697289	4.444466	4.425087	26.559	26.523	35.07107	35.03406	145.63498	171.33528	31.732375	13.33	45.058625				
	2	GULF MAS	18.90	32.9	3.538849	3.44432	6.730191	6.700847	16.304	16.267	20.49769	20.46587	93.948842	110.52805	0	20.18	20.17975				
	3	TRIFOSA	28.71	62.3	0.983014	0.956756	3.365095	3.350423	14.302	14.280	18.63585	18.6137	74.48674	87.631459	0	10.09	10.089875				
	4	MULTI SPIRIT	12.77	25	6.094684	5.931884	4.507958	4.488303	8.714	8.691	10.72031	10.70123	59.84887	70.410435	0	13.52	13.516625				
	5	MENTARI SELARAS	14.82	22.7	6.881095	6.697289	4.444466	4.425087	7.943	7.921	9.685387	9.667231	57.663976	67.839972	0	13.33	13.32625				
	6	KOTA NASTRAT	70.93	90	8.453916	8.228097	4.82542	4.804381	28.835	28.796	38.07716	38.03697	160.05775	188.30324	7.1258667	14.47	21.594367				
	7	NAVIGATOR ARIES	64.32	90	5.898081	5.740533	2.666679	2.655052	15.935	15.914	21.04264	21.02043	90.872575	106.90891	0	8.00	7.99575				
	8	MUTIA LADJONI 7	15.77	24.9	16.71123	16.26484	8.3175	8.281235	16.028	15.986	19.71261	19.67746	120.97903	142.32827	0	24.94	24.939125				
	9	NORD VILAN	27.03	56.8	11.00975	10.71566	4.380973	4.361872	17.124	17.096	22.22203	22.19472	109.1049	128.35871	6.5691583	13.14	19.705033				
	10	TANTO HANDAL	17.57	29.4	6.487889	6.314586	5.714313	5.689398	12.602	12.572	15.71184	15.68608	80.778315	95.033311	4.8990333	17.13	22.032783				
	16																				
	17																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													993.37598	1168.6776			198.43818	1162.0484	1367.1158	1870	502.88419	26.892203

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Wednesday, 18 October 2017	1	MSC GIANNA	106.94	90			2.095248	2.086113	12.521	12.504	16.5335	16.51605	62.255255	73.241477		6.28	6.282375				
	2	TANTO SUBUR 2	26.23	54.2	6.684492	6.505937	4.190496	4.172225	15.717	15.690	20.35231	20.32685	93.639682	110.16433		12.56	12.56475				
	3	MARTINE	64.82	90	5.11167	4.975129	2.857157	2.844699	17.074	17.051	22.54569	22.52189	94.980329	111.74156		8.57	8.566875				
	4	ALIDRA	56.09	90	5.504876	5.357831	3.301603	3.287208	19.729	19.703	26.05279	26.0253	108.9619	128.19047	2.2268333	9.90	12.126333				
	5	STAR HIDRA	75.26	90	4.521862	4.401075	4.952405	4.930812	29.594	29.554	39.07919	39.03795	156.07172	183.61379		14.85	14.84925				
	6	MERATUS BONTANG	17.84	30.1	11.40296	11.09836	4.063511	4.045794	9.141	9.120	11.4182	11.3997	71.689889	84.341046		12.18	12.184				
	7	RED ROCK	27.52	58.3	12.58257	12.24647	5.841298	5.815829	23.405	23.367	30.41062	30.37362	144.04236	169.4616		17.51	17.5145				
	8	MERATUS KARIANGAU	26.14	53.9	4.718465	4.592426	3.047634	3.034346	11.376	11.356	14.72655	14.7081	67.55911	79.481306		9.14	9.138				
	9	ARGO	38.37	90	5.898081	5.740533	4.063511	4.045794	24.282	24.250	32.06498	32.03114	132.37608	155.73656		12.18	12.184				
	10	MENTARI SELARAS	21.31	39.5	23.59232	22.96213	8.063531	8.028373	22.849	22.803	29.07904	29.03756	166.41438	195.78163		24.18	24.177625				
	11	TANTO SUBUR 2	26.23	54.2	3.145643	3.061618	2.603187	2.591837	9.764	9.747	12.6431	12.62729	56.183312	66.098014	13.361	7.81	21.166375				
	12	KISIK MAS	28.71	62.2	6.684492	6.505937	3.74605	3.729716	15.915	15.889	20.73607	20.71142	93.917353	110.491		11.23	11.232125				
	13	TANTO SENTOSA	28.47	61.5	8.453916	8.228097	5.079389	5.057243	21.338	21.303	27.78759	27.75442	125.00175	147.06089		15.23	15.23				
	14	SINAR MOROTAI	48.66	90	6.094684	5.931884	4.380973	4.361872	26.179	26.144	34.57005	34.53357	142.19665	167.29017	3.006225	13.14	16.1421				
	15	SINAR BELAWAN	36.66	90	14.15539	13.77728	7.936546	7.901942	47.427	47.363	62.62691	62.56081	263.74803	310.2918		23.80	23.796875				
	16	SINAR MOROTAI	26.67	55.6	1.376219	1.339458	1.587309	1.580388	6.090	6.080	7.895514	7.885734	33.834503	39.805298		4.76	4.759375				
	17	MSC GIANNA	71.93	90	3.538849	3.44432	2.603187	2.591837	15.556	15.535	20.54163	20.51995	84.330607	99.212478		7.81	7.805375				
	18	LINTAS BATANG HARI	16.12	25.8	11.59956	11.28971	7.492099	7.459433	14.843	14.805	18.30925	18.27717	104.07496	122.44112		22.46	22.46425				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													2001.2779	2354.4446			252.18418	2215.6344	2606.6287	2260	-346.62874	-15.337555

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Thursday, 19 October 2017	1	WARNOW CHIEF	51.48	90	7.2743	7.079991	4.127004	4.10901	24.662	24.629	32.56599	32.53162	136.97828	160.02135	1.670125	12.37	14.0445				
	2	SENDANG MAS	72.16	90	22.60931	22.00538	10.98418	10.93629	65.638	65.550	86.67564	86.58416	370.98315	436.45076		32.93	32.934875				
	3	MENTAYA RIVER	22.86	43.9	12.38597	12.05512	4.952405	4.930812	15.403	15.374	19.72793	19.70106	104.53043	122.97697	3.7856167	14.85	18.634867				
	4	SERENA III	27.29	57.6	7.667505	7.462693	5.142882	5.120458	20.372	20.338	26.4542	26.42186	118.97955	139.97594	4.1196417	15.42	19.540017				
	5	KGM GOLF	4.40	25	11.20635	10.90701	6.666699	6.637631	12.886	12.853	15.85398	15.82576	92.836489	109.2194		19.99	19.989375				
	6	NORTHERN DEMOCRAT	92.81	90	10.22334	9.950257	6.476221	6.447984	38.700	38.648	51.10356	51.04962	212.59893	250.11639		19.42	19.41825				
	7	UNI AMPLE	48.12	90	5.504876	5.357831	2.476202	2.465406	14.797	14.777	19.53959	19.51897	84.437099	99.337763		7.42	7.424625				
	8	GRIYA DAYAK	21.16	39.1	8.650519	8.419448	4.190496	4.172225	11.764	11.740	14.9612	14.93975	78.836993	92.749403	15.142467	12.56	27.707217				
	9	STRAIT MAS	31.24	70.8	6.291286	6.123235	4.444466	4.425087	21.258	21.226	27.84205	27.81041	119.41985	140.49394		13.33	13.32625				
	10	SINAR AMBON	18.76	32.5	9.240327	8.993502	5.079389	5.057243	12.186	12.159	15.30842	15.28452	83.308507	98.010008		15.23	15.23				
	11	CURUG MAS	21.54	40.1	2.359232	2.296213	2.666679	2.655052	7.663	7.648	9.762694	9.748866	44.800116	52.706019		8.00	7.99575				
	12	UMSINI	75.68	90	5.11167	4.975129	2.730172	2.718268	16.315	16.293	21.54366	21.52092	91.207283	107.30269		8.19	8.186125				
	13	TB. GLOBAL MANDIRI V	4.45	25	2.359232	2.296213	1.904771	1.896466	3.682	3.672	4.529708	4.521645	24.862052	29.249473		5.71	5.71125				
	14	NAVIGATOR GLOBAL	50.06	90	8.650519	8.419448	5.587328	5.562967	33.388	33.343	44.08934	44.04281	183.08398	215.39292		16.75	16.753				
	15	BINTANG JIASIA 35	21.14	39.0	26.14816	25.4497	12.12704	12.07417	33.990	33.921	43.22463	43.16261	230.09775	270.70324		36.36	36.361625				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1976.9605	2324.7063			263.25773	2200.7295	2589.0936	2220	-369.09355	-16.625836

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Friday, 20 October 2017	1	HIJAU TERANG	42.30	90	12.18937	11.86377	4.952405	4.930812	29.594	29.554	39.07919	39.03795	171.20192	201.41402	10.6888	14.85	25.53805				
	2	MITRA SEJATRAH	3.95	25	7.864108	7.654044	5.206374	5.183674	10.064	10.037	12.3812	12.35916	70.749543	83.234757	5.9011083	15.61	21.511858				
	3	LAGUN MAS	19.56	34.6	8.060711	7.845395	3.936527	3.919363	9.965	9.944	12.57419	12.55514	68.799982	80.941155		11.80	11.80325				
	4	SENDANG MAS	68.93	90	8.453916	8.228097	5.523836	5.499751	33.009	32.964	43.58833	43.54233	180.8095	212.71706		16.56	16.562625				
	5	PALUNG MAS	17.20	28.5	0.786411	0.765404	1.841279	1.83325	3.954	3.945	4.917566	4.909372	22.952185	27.002571		5.52	5.520875				
	6	SELATAN DAMAI	27.64	58.7	7.864108	7.654044	4.190496	4.172225	16.889	16.861	21.9501	21.92346	101.50435	119.41689		12.56	12.56475				
	7	WAN HAI 216	53.58	90	11.20635	10.90701	6.095267	6.068691	36.424	36.374	48.09746	48.0467	203.21956	239.08184	7.014525	18.28	25.290525				
	8	MUTIARA PERSADA 3	39.48	90	8.453916	8.228097	6.15876	6.131907	36.803	36.753	48.59848	48.54719	199.67473	234.91145	9.018675	18.47	27.48505				
	9	MUARA MAS	21.87	41.1	2.16263	2.104862	2.031756	2.022897	5.958	5.946	7.600265	7.589608	35.415373	41.665145		6.09	6.092				
	10	SURYA PEKIK	38.93	90	6.094684	5.931884	5.714313	5.689398	34.147	34.101	45.09137	45.04379	181.81363	213.89839		17.13	17.13375				
	11	MENTARI	13.73	20.2	4.128657	4.018373	3.111126	3.097561	5.076	5.061	6.120529	6.108309	36.722422	43.202849		9.33	9.328375				
	12	GUNUNG DEMPO	67.03	90	25.16515	24.49294	9.39687	9.355899	56.153	56.077	74.15026	74.072	328.86347	386.8982	1.8928083	28.18	30.068308				
	13	HIJAU TERANG	84.59	90	5.898081	5.740533	4.127004	4.10901	24.662	24.629	32.56599	32.53162	134.2626	157.956	2.2268333	12.37	14.601208				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1735.9893	2042.3403			223.50063	1925.9648	2265.841	1966	-299.84096	-15.25132

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Saturday, 21 October 2017	1	KOTA JUTA	76.61	90	14.94181	14.54268	8.380992	8.34445	50.082	50.015	66.13401	66.06422	278.50551	327.65354		25.13	25.1295					
	2	MILA UTAMA	24.60	49.1	4.325259	4.209724	3.809542	3.792932	13.084	13.060	16.85952	16.8376	75.978527	89.386502	13.806367	11.42	25.228867					
	3	MUTIARA PERSADA III	34.49	82.4	0.786411	0.765404	2.222233	2.212544	12.226	12.209	16.09936	16.08192	62.603222	73.650849		6.66	6.663125					
	4	MERATUS PALEMBANG	21.09	38.9	8.453916	8.228097	5.269866	5.246889	14.729	14.699	18.72605	18.69915	94.051038	110.64828		15.80	15.801125					
	5	TANTO TANGGUH	24.21	48.0	6.487889	6.314586	2.603187	2.591837	8.752	8.736	11.26314	11.24835	57.996429	68.231093	9.2413583	7.81	17.046733					
	6	INTAN DAYA 88	30.47	68.2	2.16263	2.104862	2.603187	2.591837	12.022	12.004	15.72272	15.70462	64.915587	76.371279		7.81	7.805375					
	7	SINAR SABANG	67.37	90	4.915068	4.783778	2.857157	2.844699	17.074	17.051	22.54569	22.52189	94.592375	111.28515		8.57	8.566875					
	8	NEW LIFE	33.32	78.2	5.898081	5.740533	2.793664	2.781483	14.635	14.614	19.2372	19.21602	84.916664	99.901957		8.38	8.3765					
	9	ISA EXPRESS	72.65	90	30.86662	30.04212	13.01594	12.95918	77.780	77.675	102.7081	102.5997	447.64594	526.64228		39.03	39.026875					
	10	PALUNG MAS	14.85	22.7	3.932054	3.827022	2.920649	2.907915	5.234	5.220	6.384774	6.372828	36.799231	43.293213		8.76	8.75725					
	11	CPO NORFOLK	86.58	90	4.521862	4.401075	3.873034	3.856148	23.144	23.113	30.56193	30.52968	124.00083	145.88333		11.61	11.612875					
	12	LINTAS BARITO	18.84	32.7	12.97578	12.62917	5.650821	5.626182	13.629	13.599	17.129	17.10234	98.34147	115.69585	10.132092	16.94	27.075467					
	13	CIREMAI	56.63	90	4.915068	4.783778	2.031756	2.022897	12.141	12.125	16.03249	16.01557	70.067577	82.432444	24.383825	6.09	30.475825					
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1590.4144	1871.0758			231.56639	1787.2458	2102.6422	2040	-62.642156	-3.0706939

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Sunday, 22 October 2017	1	KIRANA IX	35.38	85.6	7.077697	6.88864	3.682557	3.666501	21.006	20.977	27.69521	27.66555	118.65901	139.59884		11.04	11.04175					
	2	TANTO RAYA	20.70	37.8	6.291286	6.123235	3.619065	3.603285	9.867	9.847	12.52217	12.50394	64.376548	75.737115		10.85	10.851375					
	3	TANTO TANGGUH	24.52	48.9	5.701478	5.549182	4.127004	4.10901	14.116	14.091	18.18548	18.1618	84.040735	98.871453	23.827117	12.37	36.201492					
	4	SANTIKA NUSANTARA	23.99	47.3	21.8229	21.23997	7.619084	7.585864	25.300	25.254	32.53631	32.49336	173.85135	204.531		22.85	22.845					
	5	PRATIWI RAYA	26.69	55.7	16.12142	15.69079	6.349237	6.321553	24.385	24.344	31.61578	31.57663	156.40437	184.00514	9.4640417	19.04	28.501542					
	6	KMTC NHAVA SHEVA	74.18	90	12.97578	12.62917	5.587328	5.562967	33.388	33.343	44.08934	44.04281	191.61896	225.43408	2.2268333	16.75	18.979833					
	7	MERATUS BATAM	25.51	52.0	9.240327	8.993502	6.730191	6.700847	24.299	24.257	31.40072	31.3608	142.98263	168.21486	8.0166	20.18	28.19635					
	8	SPIL CAYA	61.52	90	5.11167	4.975129	6.857176	6.827278	40.977	40.921	54.10965	54.05254	213.83127	251.5662		20.56	20.5605					
	9	SINAR SABANG	55.89	90	29.49041	28.70267	11.80958	11.75809	70.571	70.476	93.18884	93.09049	409.08633	481.27803		35.41	35.40975					
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1554.8512	1829.2367			212.58759	1735.5507	2041.8243	1674	-367.8243	-21.972778

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Monday, 23 October 2017	1	EASTGATE	38.15	90	18.28405	17.79565	8.380992	8.34445	50.082	50.015	66.13401	66.06422	285.10072	335.41262		25.13	25.1295				
	2	NORTHERN DIAMOND	55.15	90	8.847122	8.6108	5.460344	5.436536	32.629	32.585	43.08731	43.04184	179.69889	211.41046	8.350625	16.37	24.722875				
	3	GUNUNG DEMPO	38.99	90	12.18937	11.86377	5.841298	5.815829	34.906	34.859	46.0934	46.04476	197.61324	232.48617		17.51	17.5145				
	4	COUGAR	23.76	46.6	16.71123	16.26484	6.730191	6.700847	22.057	22.016	28.34292	28.30527	147.12844	173.09229	20.264183	20.18	40.443933				
	5	SAWU SEA	19.75	35.1	7.2743	7.079991	5.015897	4.994027	12.858	12.830	16.24023	16.2158	82.507738	97.067928	2.338175	15.04	17.3778				
	6	KANAL MAS	11.73	25	12.58257	12.24647	5.079389	5.057243	9.818	9.793	12.07922	12.05772	78.713327	92.603914		15.23	15.23				
	7	CSCL SAN JOSE	40.79	90	16.31802	15.88214	7.873053	7.838726	47.047	46.984	62.12589	62.06033	266.129	313.09294	3.1175667	23.61	26.724067				
	8	KABOGA BARU II	11.78	25	3.342246	3.252969	3.301603	3.287208	6.382	6.365	7.851493	7.837518	41.619999	48.964705	1.7814667	9.90	11.680967				
	9	PEDHOULAS FARMER	56.82	90	2.752438	2.678915	4.000019	3.982579	23.903	23.871	31.56396	31.53065	124.28229	146.21446		11.99	11.993625				
	10	Tb. GLOBAL MANDIRI	1.22	25	16.90783	16.45619	6.666699	6.637631	12.886	12.853	15.85398	15.82576	104.08715	122.45547		19.99	19.989375				
	11	SURABAYA-GRESIK			14.04305	14.0013							28.04435	32.993353		5.71	5.71125				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1534.9252	1805.7943			216.51789	1718.9654	2022.3122	1766	-256.3122	-14.513715

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Tuesday, 24 October 2017	1	TRUONG MINH DRAGON	17.49	29.2	3.735451	3.635671	2.603187	2.591837	5.710	5.696	7.115042	7.103336	38.190358	44.929832	4.4536667	7.81	12.259042				
	2	SICHEM MELBOURNE	12.62	25	15.13841	14.73403	5.968282	5.94226	11.536	11.506	14.19308	14.16782	93.186476	109.63115		17.90	17.89525				
	3	SANGGAU	22.07	41.6	7.470903	7.271342	4.253989	4.235441	12.625	12.600	16.11941	16.09695	80.673228	94.909681	9.4640417	12.76	22.219167				
	4	MERATUS BONTANG	7.48	25	11.20635	10.90701	6.349237	6.321553	12.273	12.241	15.09903	15.07215	89.468722	105.25732		19.04	19.0375				
	5	DARYA LOK	37.42	90	10.41994	10.14161	4.444466	4.425087	26.559	26.523	35.07107	35.03406	152.61815	179.55077		13.33	13.32625				
	6	MUARA MAS	8.44	25	4.718465	4.592426	2.920649	2.907915	5.645	5.631	6.945552	6.933189	40.294355	47.405123	7.7939167	8.76	16.551167				
	7	SAWU SEA	11.17	25	8.060711	7.845395	4.127004	4.10901	7.977	7.956	9.814366	9.796898	59.687087	70.220102		12.37	12.374375				
	8	MERATUS SABANG	6.83	25	19.46367	18.94376	8.254008	8.218019	15.955	15.913	19.62873	19.5938	125.96939	148.19928		24.75	24.74875				
	9	MERATUS GORONTALO	17.00	27.9	6.881095	6.697289	5.396851	5.37332	11.420	11.392	14.18132	14.15747	75.498801	88.822119	4.342325	16.18	20.5242				
	10	NORTHERN DIAMOND	37.48	90	12.18937	11.86377	5.841298	5.815829	34.906	34.859	46.0934	46.04476	197.61324	232.48617		17.51	17.5145				
	11	LABOBAR	25.87	53.1	10.81315	10.52431	5.142882	5.120458	18.921	18.888	24.47578	24.44491	118.33083	139.21274		15.42	15.420375				
	12	XONNE	16.42	26.5	16.71123	16.26484	9.460363	9.419114	19.165	19.116	23.6955	23.65457	137.48693	161.74933		28.37	28.365875				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1209.0176	1422.3736			220.23645	1396.2185	1642.6101	2214	571.38994	25.808037

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Wednesday, 25 October 2017	1	BERKAH 36	10.42	25	8.257313	8.036746	4.444466	4.425087	8.591	8.568	10.56932	10.55051	63.442808	74.638598	6.5691583	13.33	19.895408				
	2	ASIA GLORY	5.31	25	1.769424	1.72216	4.698435	4.677949	9.082	9.058	11.17328	11.15339	53.334547	62.746526		14.09	14.08775				
	3	CAPE MORETON	21.49	40.0	31.25983	30.42482	12.95244	12.89597	37.106	37.032	47.2611	47.19405	256.12656	301.32537		38.84	38.8365				
	4	MERATUS SABANG	4.34	25	13.17238	12.82052	7.301622	7.269786	14.114	14.077	17.36388	17.33297	103.45156	121.70772	2.7835417	21.89	24.676667				
	5	SMB II	7.92	25	17.10443	16.64755	6.031775	6.005476	11.659	11.629	14.34407	14.31854	97.739568	114.98773	8.9073333	18.09	26.992958				
	6	HUMMING BIRD	6.68	25	4.521862	4.401075	3.365095	3.350423	6.505	6.488	8.002483	7.98824	44.621276	52.495618		10.09	10.089875				
	7	Tb. PRIME 16	1.09	25	3.735451	3.635671	2.476202	2.465406	4.786	4.774	5.88862	5.878139	33.639711	39.57613		7.42	7.424625				
	8	VEGA STAR	14.75	22.5	13.76219	13.39458	5.841298	5.815829	10.382	10.354	12.65228	12.62847	84.830688	99.800809		17.51	17.5145				
	9	PORADO	11.71	25	1.572822	1.530809	2.031756	2.022897	3.927	3.917	4.831688	4.823088	24.657344	29.00864		6.09	6.092				
	10	PUPUK INDONESIA	10.34	25	9.830135	9.567555	7.047653	7.016924	13.623	13.587	16.75992	16.73009	94.162134	110.77898		21.13	21.131625				
	11	THOR INFINITY	21.50	40.0	5.504876	5.357831	4.127004	4.10901	11.832	11.808	15.07067	15.04929	72.858762	85.716191		12.37	12.374375				
	12	RORO PRYASTI	11.60	25	3.735451	3.635671	3.238111	3.223992	6.259	6.243	7.700503	7.686797	41.722353	49.085121		9.71	9.709125				
	13	ASIKE GLOBAL	4.96	25	3.342246	3.252969	2.476202	2.465406	4.786	4.774	5.88862	5.878139	32.863803	38.663298		7.42	7.424625				
	14	TUNAS BARU	13.71	20.1	0.983014	0.956756	1.33334	1.327526	2.172	2.166	2.618332	2.613098	14.169898	16.670468		4.00	3.997875				
	15	HAMBURG PEARL	13.55	25	4.128657	4.018373	3.111126	3.097561	6.014	5.998	7.398522	7.385354	41.151154	48.413122		9.33	9.328375				
	16	MARINA 1611	0.78	25	9.830135	9.567555	4.888912	4.867596	9.450	9.425	11.62625	11.60556	71.261313	83.836839		14.66	14.658875				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1130.0335	1329.4512			171.4155	1275.7367	1500.8667	2106	605.13334	28.733777

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Thursday, 26 October 2017	1	TIGER ZHEJIANG	9.43	25	15.53161	15.11674	7.23813	7.206571	13.991	13.954	17.21289	17.18225	107.43345	126.3923		21.70	21.70275				
	2	MERATUS KAPUAS	3.82	25	25.36175	24.68429	10.34926	10.30413	20.005	19.952	24.61141	24.5676	159.83527	188.04149	8.5733083	31.03	39.604433				
	3	NAVIGATOR ARIES	6.90	25	3.735451	3.635671	2.222233	2.212544	4.295	4.284	5.284659	5.275253	30.945496	36.406466		6.66	6.663125				
	4	SUNGAI MAS	8.42	25	6.487889	6.314586	4.634943	4.614734	8.959	8.936	11.02229	11.00267	61.971885	72.908099		13.90	13.897375				
	5	MERATUS PEKANBARU	3.35	25	1.376219	1.339458	2.666679	2.655052	5.155	5.141	6.341591	6.330303	31.004926	36.476383		8.00	7.99575				
	6	FELYA	4.38	25	10.41994	10.14161	5.015897	4.994027	9.695	9.670	11.92823	11.907	73.772282	86.79092		15.04	15.039625				
	7	LYOLIA	3.65	25	9.043724	8.802151	4.57145	4.551518	8.836	8.813	10.8713	10.85195	66.34173	78.049095	3.8969583	13.71	17.603958				
	8	VALERIE SCHULTE	11.75	25	4.128657	4.018373	3.301603	3.287208	6.382	6.365	7.851493	7.837518	43.171814	50.79037	4.67635	9.90	14.57585				
	9	MITRA PROGRESS III	3.96	25	9.830135	9.567555	6.285744	6.258338	12.150	12.118	14.94803	14.92143	86.079491	101.26999		18.85	18.847125				
	10	MENTARI SUCCESS	3.99	25	9.633532	9.376204	5.777805	5.752614	11.168	11.139	13.74011	13.71566	80.303109	94.474246	11.690875	17.32	29.015				
	11	ORIENTAL GALAXY	6.91	25	8.060711	7.845395	4.444466	4.425087	8.591	8.568	10.56932	10.55051	63.054854	74.182182	7.014525	13.33	20.340775				
	12	PELANGI MAS	2.11	25	4.521862	4.401075	2.793664	2.781483	5.400	5.386	6.643571	6.631746	38.559294	45.363875		8.38	8.3765				
	13	AS MARINE	1.49	25	10.02674	9.758906	5.841298	5.815829	11.291	11.261	13.8911	13.86638	81.75257	96.179495		17.51	17.5145				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													924.22618	1087.3249			231.17677	1120.7264	1318.5017	2114	795.49832	37.630006

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Friday, 27 October 2017	1	DARYA LOK	10.53	25	4.718465	4.592426	3.301603	3.287208	6.382	6.365	7.851493	7.837518	44.335676	52.159619		9.90	9.8995				
	2	SPIL NINGSIH	8.19	25	8.257313	8.036746	5.269866	5.246889	10.186	10.160	12.53219	12.50988	72.199004	84.940005		15.80	15.801125				
	3	PRATIWI RAYA	2.50	25	21.03649	20.47457	8.444485	8.407666	16.323	16.280	20.0817	20.04596	131.09368	154.22786		25.32	25.319875				
	4	MERATUS KAPUAS	3.42	25	3.342246	3.252969	4.698435	4.677949	9.082	9.058	11.17328	11.15339	56.438177	66.397856	4.342325	14.09	18.430075				
	5	KURAU	3.15	25	7.2743	7.079991	4.82542	4.804381	9.327	9.303	11.47526	11.45483	65.54436	77.111012		14.47	14.4685				
	6	SEMPATI	0.70	25	4.325259	4.209724	3.619065	3.603285	6.995	6.977	8.606444	8.591126	46.927536	55.208866		10.85	10.851375				
	7	TIGA RODA	5.51	25	12.38597	12.05512	7.111145	7.08014	13.745	13.710	16.91091	16.88081	99.879087	117.50481		21.32	21.322				
	8	MAIDEN ENERGY	10.23	25	13.95879	13.58593	8.507977	8.470881	16.445	16.402	20.23269	20.19668	117.8009	138.58929	2.8948833	25.51	28.405133				
	9	MUTIARA PERSADA 3	5.60	25	7.864108	7.654044	5.396851	5.37332	10.432	10.405	12.83417	12.81133	72.770204	85.612004	4.2309833	16.18	20.412858				
	10	ANTHOS	11.55	25	12.77918	12.43782	5.714313	5.689398	11.045	11.017	13.58912	13.56494	85.836817	100.98449		17.13	17.13375				
	11	WAN HAI 212	7.87	25	2.16263	2.104862	2.666679	2.655052	5.155	5.141	6.341591	6.330303	32.556741	38.302048		8.00	7.99575				
	12	HARRY 06	1.05	25	11.99276	11.67242	7.746069	7.712295	14.973	14.934	18.42081	18.38802	105.83871	124.51614		23.23	23.22575				
	13	SINAR SUMBA	9.26	25	6.487889	6.314586	4.317481	4.298656	8.345	8.324	10.26734	10.24906	58.604117	68.94602	5.4557417	12.95	18.401242				
	14	OCEAN HIRYU	8.95	25	15.72822	15.30809	8.000038	7.965157	15.464	15.423	19.02477	18.99091	115.90405	136.35771		23.99	23.98725				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1105.7291	1300.8577			255.65418	1323.0351	1556.5119	2280	723.4881	31.731934

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Saturday, 28 October 2017	1	TANTO SEMANGAT	8.10	25	16.31802	15.88214	7.492099	7.459433	14.482	14.444	17.81685	17.78514	111.67948	131.38763	6.346475	22.46	28.810725				
	2	MUTIARA PERSADA 3	8.22	25	9.240327	8.993502	5.142882	5.120458	9.941	9.915	12.23021	12.20844	72.791666	85.637254	3.2289083	15.42	18.649283				
	3	SUNGAI MAS	11.10	25	14.352	13.96863	7.682576	7.64908	14.850	14.811	18.26982	18.2373	109.82061	129.20071	8.1279417	23.04	31.163317				
	4	MERATUS BENOA	4.00	25	10.41994	10.14161	3.809542	3.792932	7.364	7.344	9.059415	9.04329	60.974764	71.735017	4.342325	11.42	15.764825				
	5	MERATUS BANJAR I	6.78	25	8.453916	8.228097	6.222252	6.195122	12.027	11.996	14.79704	14.77071	82.690261	97.28266		18.66	18.65675				
	6	AYER MAS	2.70	25	5.308273	5.16648	4.190496	4.172225	8.100	8.079	9.965357	9.947619	54.929287	64.62269		12.56	12.56475				
	7	MSC GIANNA	17.82	30.0	9.43693	9.184853	3.936527	3.919363	8.839	8.819	11.03898	11.02107	66.195576	77.877148		11.80	11.80325				
	8	RORO SAWITRI	5.30	25	13.76219	13.39458	6.539714	6.5112	12.641	12.608	15.552	15.52431	96.532782	113.56798	8.5733083	19.61	28.181933				
	9	SINAR SUMBA	13.22	25	12.77918	12.43782	6.98416	6.953709	13.500	13.465	16.60893	16.57937	99.307888	116.83281	7.7939167	20.94	28.735167				
	10	KURAU	5.35	25	11.00975	10.71566	4.82542	4.804381	9.327	9.303	11.47526	11.45483	72.915483	85.782921	4.5650083	14.47	19.033508				
	11	TANTO LUAS	4.66	25	5.504876	5.357831	4.253989	4.235441	8.223	8.201	10.11635	10.09834	55.990794	65.871523		12.76	12.755125				
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													883.82859	1039.7983			226.11863	1076.0294	1265.917	2220	954.08302	42.976713

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Monday, 29 October 2017	1	HIJAU TERANG	7.35	25	12.58257	12.24647	5.079389	5.057243	9.818	9.793	12.07922	12.05772	78.713327	92.603914		15.23	15.23					
	2	NAVIGATOR GLOBAL	12.45	25	13.76219	13.39458	7.23813	7.206571	13.991	13.954	17.21289	17.18225	103.94187	122.28455	4.342325	21.70	26.045075					
	3	PULAU WETAR	8.17	25	6.881095	6.697289	4.761928	4.741165	9.205	9.180	11.32427	11.30411	64.094899	75.405764	18.03735	14.28	32.315475					
	4	FATIMA III	6.10	25	9.240327	8.993502	5.777805	5.752614	11.168	11.139	13.74011	13.71566	79.527202	93.561414	7.4598917	17.32	24.784017					
	5	MERATUS BATAM	5.29	25	6.487889	6.314586	3.936527	3.919363	7.609	7.589	9.361396	9.344733	54.562796	64.191524	7.5712333	11.80	19.374483					
	6	MAIDEN ENERGY	17.03	28.0	3.932054	3.827022	2.222233	2.212544	4.712	4.700	5.85267	5.842842	33.301824	39.178617		6.66	6.663125					
	7	GH ZONDA	22.80	43.8	8.257313	8.036746	4.952405	4.930812	15.354	15.324	19.66032	19.6335	96.149093	113.11658		14.85	14.84925					
	8	HONGKONG BRIDGE	25.82	52.9	6.094684	5.931884	3.238111	3.223992	11.886	11.865	15.37308	15.35367	72.966175	85.842559		9.71	9.709125					
	9	TANTO SEMANGAT	10.56	25	2.752438	2.678915	1.714294	1.706819	3.314	3.305	4.076737	4.069481	23.617299	27.785058		5.14	5.140125					
	10	URU BHUM	22.66	43.4	8.650519	8.419448	5.269866	5.246889	16.206	16.175	20.74144	20.71303	101.42306	119.32125		15.80	15.801125					
	11	SPEETRUM W	10.54	25	7.2743	7.079991	4.380973	4.361872	8.468	8.446	10.41833	10.39978	60.829486	71.564101	8.9073333	13.14	22.043208					
	12	ARMADA SEJATI	8.80	25	7.2743	7.079991	5.206374	5.183674	10.064	10.037	12.3812	12.35916	69.585682	81.865508		15.61	15.61075					
	13	LAGUN MAS	10.32	25	10.61655	10.33296	4.698435	4.677949	9.082	9.058	11.17328	11.15339	70.792468	83.285256		14.09	14.08775					
	14	ASIA PESONA	4.99	25	14.94181	14.54268	6.98416	6.953709	13.500	13.465	16.60893	16.57937	103.57538	121.85339		20.94	20.94125					
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1013.0806	1191.8595			242.59476	1219.2861	1434.4542	2200	765.54576	34.797534

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Sunday, 30 October 2017	1	SURYA INDAH JAYA	1.58	25	0	0	1.142863	1.13788	2.209	2.203	2.717825	2.712987	12.123964	14.263487		3.43	3.42675					
	2	OCEAN HIRYU	19.32	34.0	6.684492	6.505937	4.000019	3.982579	9.968	9.946	12.56112	12.54192	66.189321	77.869789		11.99	11.993625					
	3	MERATUS GORONTALO	16.98	27.9	4.915068	4.783778	3.873034	3.856148	8.186	8.166	10.16441	10.14731	54.091592	63.637167		11.61	11.612875					
	4	TELUK BERAU	7.44	25	6.684492	6.505937	4.317481	4.298656	8.345	8.324	10.26734	10.24906	58.992071	69.402436	8.9073333	12.95	21.852833					
	5	Tb. CLUMENT I	2.99	25	12.77918	12.43782	5.206374	5.183674	10.064	10.037	12.3812	12.35916	80.448388	94.645162		15.61	15.61075					
	6	SURABAYA - GRESIK			62.72562	62.53914							125.26476	147.37031		25.51	25.51025					
	7	PANGEMPANG	9.80	25	6.684492	6.505937	3.74605	3.729716	7.241	7.222	8.908425	8.892569	52.930089	62.270693		11.23	11.232125					
	8	TIGER ZHEJIANG	21.56	40.2	5.504876	5.357831	4.127004	4.10901	11.876	11.852	15.1308	15.10938	73.067153	85.961356		12.37	12.374375					
	9	Tb. SEMAR SATU	2.27	25	0.786411	0.765404	1.650802	1.643604	3.191	3.183	3.925747	3.918759	19.064208	22.428479		4.95	4.94975					
	10	GRESIK - SURABAYA			41.66105	41.53719							83.198238	97.88028		16.94	16.943375					
	11	SINAR PAPUA	9.33	25	4.325259	4.209724	2.984141	2.97113	5.768	5.753	7.096542	7.083911	40.192	47.284706		8.95	8.947625					
	12	ARMADA SEJATI	12.08	25	7.077697	6.88864	3.428588	3.413639	6.627	6.610	8.153474	8.138961	50.338229	59.221445		10.28	10.28025					
	13	SEGARA MAS	27.47	58.2	8.257313	8.036746	5.079389	5.057243	20.300	20.267	26.37289	26.34078	119.71134	140.83688	7.4598917	15.23	22.689892					
	14	URU BHUM	30.57	68.5	9.043724	8.802151	4.444466	4.425087	20.619	20.588	26.97186	26.94087	121.83567	143.33608		13.33	13.32625					
	15	TIGA RODA	14.15	21.1	8.257313	8.036746	4.82542	4.804381	8.160	8.137	9.884178	9.864935	61.970431	72.906389	7.7939167	14.47	22.262417					
	16	AS CONSTANTINA	28.37	61.1	9.633532	9.376204	5.714313	5.689398	23.888	23.849	31.10143	31.06423	140.31634	165.07804		17.13	17.13375					
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1159.7338	1364.3927			230.14689	1355.3586	1594.5396	2220	625.46041	28.173892

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Tuesday, 31 October 2017	1	DARWIN	41.93	90	11.59956	11.28971	7.809561	7.775511	46.668	46.605	61.62488	61.55984	254.93159	299.91952	0	23.42	23.416125					
	2	MITRA KENDARI	17.38	28.9	4.128657	4.018373	2.349218	2.338975	5.111	5.098	6.363731	6.35321	35.761427	42.072267	0	7.04	7.043875					
	3	DIA CHENG	11.57	25	10.22334	9.950257	4.888912	4.867596	9.450	9.425	11.62625	11.60556	72.037221	84.749672	0	14.66	14.658875					
	4	AS SAVONIA	29.62	65.3	9.633532	9.376204	4.761928	4.741165	21.135	21.102	27.5933	27.56106	125.90462	148.12308	0	14.28	14.278125					
	5	INTAN DAYA 12	18.99	33.1	3.932054	3.827022	3.809542	3.792932	9.284	9.264	11.67867	11.6606	57.249	67.351765	0	11.42	11.4225					
	6	TANTO SUBUR II	12.08	25	8.650519	8.419448	5.587328	5.562967	10.800	10.772	13.28714	13.26349	76.34268	89.814917	0	16.75	16.753					
	7	SURYA PEKIK	24.07	47.5	11.99276	11.67242	6.793683	6.764062	22.653	22.611	29.13907	29.10067	140.72682	165.56097	13.361	20.37	33.731125					
	8	MERATUS KARIANGAU	10.12	25	10.81315	10.52431	4.444466	4.425087	8.591	8.568	10.56932	10.55051	68.486208	80.572009	19.262108	13.33	32.588358					
	9	TR ATHOS	9.76	25	8.060711	7.845395	5.142882	5.120458	9.941	9.915	12.23021	12.20844	70.463943	82.898757	10.02075	15.42	25.441125					
	10	MENTAYA RIVER	83.57	90	25.55835	24.87564	9.65084	9.608761	57.671	57.593	76.15432	76.07395	337.18547	396.68879	0	28.94	28.937					
	11	AS CONSTANTINA	29.62	65.3	8.257313	8.036746	4.888912	4.867596	21.699	21.665	28.32912	28.29602	126.03947	148.28173	0	14.66	14.658875					
	12	AS SAVONIA	28.41	61.3	0.786411	0.765404	2.984141	2.97113	12.498	12.478	16.27395	16.2545	65.01204	76.484753	0	8.95	8.947625					
																		TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL													1430.1405	1682.5182			231.87661	1627.2356	1914.3948	1960	45.60516	2.3267939

ATTACHMENT 1
FUEL ESTIMATION
(DAILY REPORT WORKING HOUR)

KT. BIMA 333

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			L	L	L					
Sunday, 01 October 2017	1	UNI FORTUNA	CON	5.898	5.741	4.127	4.109	21.068	21.037	29.066	29.034	120.079	141.27		12.37	12.37					
	2	CURUG MAS	CON	4.915	4.784	3.810	3.793	7.364	7.344	9.059	9.043	50.112	58.96	0.00	11.42	11.42					
	3	MITRA PROGRES 3	CON	0.983	0.957	2.540	2.529	4.909	4.896	6.040	6.029	28.882	33.98		7.62	7.62					
	4	CAPE FULMAR	CON	22.609	22.005	10.159	10.114	33.520	33.459	43.091	43.034	217.993	256.46	0.00	30.46	30.46					
	5	TELUK BERAU	CON	4.915	4.784	3.810	3.793	7.364	7.344	9.059	9.043	50.112	58.96	15.59	11.42	27.01					
	6	NAVIGATOR ARIES	LPG	10.813	10.524	5.714	5.689	16.585	16.552	21.144	21.114	108.137	127.22	0.00	17.13	17.13					
	7	TANTO DAMAI	GC	7.864	7.654	6.032	6.005	10.111	10.082	12.233	12.209	72.189	84.93	0.00	18.09	18.09					
	8	SINAR BELAWAN	CON	0.983	0.957	3.175	3.161	6.346	6.330	7.836	7.822	36.610	43.07		9.52	9.52					
	9	CAPE FULMAR	CON	12.779	12.438	6.349	6.322	20.455	20.417	26.256	26.221	131.236	154.40	0.00	19.04	19.04					
	10	ORIENTAL DIAMOND	CON	6.881	6.697	6.032	6.005	23.786	23.747	30.881	30.843	134.873	158.67		18.09	18.09					
	11	MENTARI SENTOSA	GC	2.949	2.870	4.444	4.425	8.591	8.568	10.569	10.551	52.968	62.32	6.68	13.33	20.01					
	12	TANTO RAYA	CON	13.762	13.395	6.667	6.638	12.886	12.853	15.854	15.826	97.880	115.15	19.48	19.99	39.47					
	13	BEETHOVEN	CON	5.898	5.741	4.444	4.425	26.559	26.523	35.071	35.034	143.695	169.05	13.92	13.33	27.24					
	14	OLYMPIA	CON	13.762	13.395	6.984	6.954	41.735	41.679	55.112	55.054	234.674	276.09		20.94	20.94					
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1479.4401	1740.5177			278.40958	1716.0882	2018.9273	1940	-78.927298	-4.0684174

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Monday, 02 October 2017	1	KANG MAY	BC	7.864108	7.654044	6.349237	6.321553	37.941	37.890	50.10153	50.04865	204.17044	240.20052		19.04	19.0375					
	2	GUNTHER SCHULTE	GC	19.66027	19.13511	10.15878	10.11449	60.706	60.624	80.16244	80.07784	340.63904	400.75181	0	30.46	30.46					
	3	STRAIT MAS	CON	1.966027	1.913511	3.49208	3.476854	11.329	11.307	14.54791	14.52849	62.560901	73.601061	0	10.47	10.470625					
	4	LEAP HEART	BC	33.42246	32.52969	14.60324	14.53957	43.178	43.093	55.11552	55.03857	291.52081	342.96565	0	43.79	43.78625					
	5	MERATUS GORONTALO	CON	5.898081	5.740533	4.761928	4.741165	20.380	20.347	26.56324	26.53177	114.96395	135.2517	5.5670833	14.28	19.845208					
	6	LIDYA	CON	10.81315	10.52431	6.031775	6.005476	36.044	35.996	47.59645	47.54622	200.55713	235.94957	0	18.09	18.085625					
	7	TELUK FLAMINGGO	CON	13.76219	13.39458	6.666699	6.637631	11.373	11.341	13.79077	13.76408	90.730093	106.74129		19.99	19.989375					
	8	FLORES SEA	GC	19.66027	19.13511	9.523855	9.48233	17.549	17.501	21.47526	21.43581	135.76254	159.72064	3.8969583	28.56	32.453208					
	9	MERATUS MEDAN I	CON	5.898081	5.740533	4.127004	4.10901	13.655	13.629	17.55612	17.5329	82.247708	96.76201	6.6805	12.37	19.054875					
	10	HONGKONG BRIDGE	CON	14.7452	14.35133	7.619084	7.585864	45.529	45.468	60.12183	60.05838	255.47928	300.56386		22.85	22.845					
	11	BONNY STAR	CON	15.72822	15.30809	7.619084	7.585864	14.752	14.713	18.15242	18.12014	111.97912	131.74014	4.4536667	22.85	27.298667					
	12																				
	13																				
	14																				
	15																TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1890.611	2224.2483			263.32633	2114.4384	2487.5746	2054	-433.57459	-21.108792

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Tuesday, 03 October 2017	1	TANTO DAMAI	CON	5.898081	5.740533	4.127004	4.10901	19.291	19.262	25.24253	25.2136	108.88404	128.09887	1.670125	12.37	14.0445						
	2	OLYMPIA	CON	14.7452	14.35133	7.301622	7.269786	43.632	43.574	57.61675	57.55595	246.04667	289.46667	0	21.89	21.893125						
	3	FATIMA III	GC	18.67726	18.17835	8.254008	8.218019	20.496	20.451	25.82176	25.78222	145.87875	171.62206	0	24.75	24.74875						
	4	MERATUS BENOA	GC	13.76219	13.39458	6.666699	6.637631	11.774	11.741	14.33689	14.3098	92.622624	108.96779	0	19.99	19.989375						
	5	MERATUS KARIMATA	CON	6.881095	6.697289	4.444466	4.425087	9.153	9.130	11.33562	11.31624	63.382665	74.567841	0	13.33	13.32625						
	6	NIRBITA	OT	6.881095	6.697289	4.761928	4.741165	28.456	28.418	37.57614	37.53649	155.0676	182.43247		14.28	14.278125						
	7	MERATUS MEDAN I	CON	3.932054	3.827022	6.98416	6.953709	33.011	32.961	43.2152	43.16587	174.05077	204.76562		20.94	20.94125						
	8	LUZON	BC	11.79616	11.48107	6.349237	6.321553	33.183	33.135	43.61276	43.56471	189.4435	222.87471	0	19.04	19.0375						
	9	NRS V	LCT	5.898081	5.740533	4.444466	4.425087	8.591	8.568	10.56932	10.55051	58.787363	69.161603	0	13.33	13.32625						
	10	MUTIARA PERSADA 3	PAS	6.881095	6.697289	4.444466	4.425087	19.097	19.067	24.89589	24.86644	110.37415	129.85194	0	13.33	13.32625						
	11	KOTA NABIL	CON	6.881095	6.697289	4.444466	4.425087	26.559	26.523	35.07107	35.03406	145.63498	171.33528		13.33	13.32625						
	12	ISA EXPRESS	BC	4.915068	4.783778	3.809542	3.792932	22.765	22.734	30.06092	30.02919	122.89022	144.57673	0	11.42	11.4225						
	13	PAC SCHEDAR	GC	11.79616	11.48107	6.666699	6.637631	39.838	39.785	52.6066	52.55108	221.36213	260.42604	0	19.99	19.989375						
	14	MERATUS BONTANG	GC	5.898081	5.740533	4.127004	4.10901	7.977	7.956	9.814366	9.796898	55.419595	65.199523		12.37	12.374375						
	15	SENDANG MAS	CON	5.898081	5.740533	5.714313	5.689398	34.147	34.101	45.09137	45.04379	181.42567	213.44197		17.13	17.13375						
	16	MILA UTAMA	RO	11.79616	11.48107	6.349237	6.321553	14.626	14.593	18.30855	18.2793	101.75482	119.71155		19.04	19.0375						
	17																TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												2173.0255	2556.5006			268.19513	2400.9914	2824.6958	2240	-584.69577	-26.10249	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Wednesday, 04 October 201	1	SPIL CAYA	CON	16.71123	16.26484	9.206393	9.166252	55.015	54.941	72.64721	72.57054	306.52189	360.61399	7.7939167	27.60	35.398292						
	2	DOBONSOLO	PAS	7.864108	7.654044	4.761928	4.741165	18.038	18.008	23.37018	23.34107	107.77831	126.79801	13.361	14.28	27.639125						
	3	TB. AS PERFECT 2	TUG	1.966027	1.913511	2.857157	2.844699	5.523	5.508	6.794561	6.782468	34.189448	40.22288		8.57	8.566875						
	4	TANTO SENANG	CON	16.71123	16.26484	8.254008	8.218019	31.543	31.490	40.88574	40.83502	194.20164	228.47252	0	24.75	24.74875						
	5	GIOVANNI BOTTIGUER	BC	2.949041	2.870267	3.49208	3.476854	20.868	20.840	27.55584	27.52676	109.57807	128.91537		10.47	10.470625						
	6	PRATAMA I	TUG	3.932054	3.827022	4.127004	4.10901	7.977	7.956	9.814366	9.796898	51.540057	60.635361		12.37	12.374375						
	7	MUARA MAS	CON	1.966027	1.913511	2.857157	2.844699	5.729	5.714	7.075467	7.063165	35.162894	41.36811		8.57	8.566875						
	8	BONNY STAR	CON	2.949041	2.870267	4.761928	4.741165	10.608	10.583	13.23857	13.21699	62.969586	74.081865		14.28	14.278125						
	9	SINAR AMBON	GC	4.915068	4.783778	3.809542	3.792932	18.340	18.313	24.02733	24.00009	101.98156	119.9783		11.42	11.4225						
	10	WARNOW CHIEF	CON	9.830135	9.567555	5.714313	5.689398	34.147	34.101	45.09137	45.04379	189.18475	222.57029		17.13	17.13375						
	11	MUTIARA PERSADA 3	PAS	7.864108	7.654044	5.079389	5.057243	26.404	26.366	34.69605	34.65775	147.77833	173.85686	3.34025	15.23	18.57025						
	12	DONGGALA VIII	GC	4.915068	4.783778	4.127004	4.10901	10.322	10.299	13.01132	12.99147	64.558469	75.95114		12.37	12.374375						
	13	TEAM OSCO	OT	9.830135	9.567555	6.031775	6.005476	31.490	31.445	41.38673	41.34112	177.09835	208.351	0	18.09	18.085625						
	14	MERATUS MEDAN I	CON	14.7452	14.35133	7.301622	7.269786	30.542	30.492	39.76558	39.71803	184.18557	216.68891		21.89	21.893125						
	15																TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1766.7289	2078.5046			241.52267	1972.0232	2320.0273	1880	-440.02729	-23.405707	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Thursday, 05 October 2017	1	GRIYA AMBON	OT	9.830135	9.567555	5.396851	5.37332	32.250	32.207	42.5863	42.54135	179.75214	211.4731	7.7939167	16.18	23.975792						
	2	LOGISTIK NUSANTARA	GC	14.7452	14.35133	7.619084	7.585864	27.982	27.934	36.19402	36.14834	172.56035	203.01218		22.85	22.845						
	3	TENG HONG	GC	8.847122	8.6108	6.666699	6.637631	27.831	27.786	36.23307	36.18972	158.80234	186.82628	3.8969583	19.99	23.886333						
	4	BUMI INDONESIA	OT	4.915068	4.783778	4.127004	4.10901	8.615	8.594	10.6841	10.66598	56.493773	66.463263		12.37	12.374375						
	5	SENDANG MAS	CON	12.77918	12.43782	6.666699	6.637631	39.838	39.785	52.6066	52.55108	223.3019	262.70812		19.99	19.989375						
	6	MERATUS KARIANGAU	CON	1.966027	1.913511	2.857157	2.844699	7.259	7.243	9.161986	9.148134	42.393472	49.874672		8.57	8.566875						
	7	MERATUS KUPANG	CON	7.864108	7.654044	5.079389	5.057243	10.747	10.721	13.34559	13.32315	73.790893	86.812815		15.23	15.23						
	8	DHARMA KARTIKA IX	RO	0.983014	0.956756	2.539695	2.528621	15.176	15.156	20.04061	20.01946	77.400684	91.059629		7.62	7.615						
	9	WARNOW CHIEF	CON	1.966027	1.913511	3.809542	3.792932	22.765	22.734	30.06092	30.02919	117.07091	137.73048		11.42	11.4225						
	10	LOUDS ISLAND	CON	2.949041	2.870267	3.174618	3.160777	18.971	18.945	25.05076	25.02433	100.14545	117.81818		9.52	9.51875						
	11	TB SEMPATI	TUG	15.72822	15.30809	8.254008	8.218019	15.955	15.913	19.62873	19.5938	118.59827	139.52737	0	24.75	24.74875						
	12	LEO PRADANA	CON	15.72822	15.30809	7.619084	7.585864	45.529	45.468	60.12183	60.05838	257.41905	302.84594		22.85	22.845						
	13	SERASI I	RO	17.69424	17.2216	8.254008	8.218019	23.033	22.986	29.2805	29.2384	155.92485	183.441	12.247583	24.75	36.996333						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1733.6541	2039.593			240.01408	1937.666	2279.6071	1874	-405.60711	-21.643923	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Friday, 06 October 2017	1	TANTO BERKAT	CON	9.830135	9.567555	5.714313	5.689398	28.492	28.450	37.37973	37.33787	162.461	191.13058	18.928083	17.13	36.061833						
	2	TANTO SELALU	CON	4.915068	4.783778	5.396851	5.37332	17.303	17.271	22.20436	22.17456	99.422159	116.96725		16.18	16.181875						
	3	ORIENTAL EMERALD	CON	9.830135	9.567555	5.396851	5.37332	32.250	32.207	42.5863	42.54135	179.75214	211.4731		16.18	16.181875						
	4	SAMUDRA MAS	CON	7.864108	7.654044	6.031775	6.005476	30.377	30.333	39.86877	39.82428	167.9585	197.59823	2.2268333	18.09	20.312458						
	5	NAVIGATOR ARIES	LPG	10.81315	10.52431	5.714313	5.689398	34.147	34.101	45.09137	45.04379	191.12452	224.85237		17.13	17.13375						
	6	TB SEMPATI	TUG	1.966027	1.913511	2.857157	2.844699	5.523	5.508	6.794561	6.782468	34.189448	40.22288		8.57	8.566875						
	7	MEGA 07	TUG	0.983014	0.956756	2.539695	2.528621	4.909	4.896	6.03961	6.02886	28.881911	33.978719		7.62	7.615						
	8	CSCL KINGSTON	CON	1.966027	1.913511	2.857157	2.844699	17.074	17.051	22.54569	22.52189	88.773068	104.4389		8.57	8.566875						
	9	KEDUNG MAS	CON	0.983014	0.956756	2.857157	2.844699	5.963	5.948	7.394778	7.382238	34.329657	40.387832		8.57	8.566875						
	10	MERATUS KUPANG	CON	0.983014	0.956756	2.539695	2.528621	15.176	15.156	20.04061	20.01946	77.400684	91.059629		7.62	7.615						
	11	MULTI SPIRIT	GC	23.59232	22.96213	11.42863	11.3788	20.771	20.714	25.37788	25.33084	161.55516	190.06489		34.27	34.2675						
	12	SPIL CITRA	CON	8.847122	8.6108	6.349237	6.321553	37.941	37.890	50.10153	50.04865	206.11021	242.4826	7.7939167	19.04	26.831417						
	13	PRATIWI RAYA	GC	21.6263	21.04862	9.206393	9.166252	21.001	20.952	26.26418	26.22196	155.48594	182.92463		27.60	27.604375						
	14	SOPHIA	BC	11.79616	11.48107	6.031775	6.005476	27.644	27.601	36.14127	36.09955	162.80038	191.52986		18.09	18.085625						
	15																TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1750.2448	2059.1115			253.59133	1965.7974	2312.7028	1920	-392.70281	-20.453271	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Saturday, 07 October 2017	1	MENTARI KRISTAL	CON	19.66027	19.13511	9.523855	9.48233	30.085	30.028	38.56964	38.51751	195.00109	234.94107	20.0415	28.56	48.59775					
	2	ANGGRAINI EXCELLENT	OT	16.71123	16.26484	7.619084	7.585864	30.615	30.565	39.78422	39.73588	188.88129	227.56782	5.010375	22.85	27.855375					
	3	BBC NEWYORK	GC	5.898081	5.740533	4.444466	4.425087	26.559	26.523	35.07107	35.03406	143.69522	169.0532	8.350625	13.33	21.676875					
	4	SPIL HANA	CON	1.966027	1.913511	3.174618	3.160777	7.138	7.122	8.915955	8.901502	42.292456	49.755831		9.52	9.51875					
	5	SPRING MAS	CON	0.983014	0.956756	3.174618	3.160777	18.971	18.945	25.05076	25.02433	96.265913	113.25402		9.52	9.51875					
	6	TB. ANTASENA	TUG	4.915068	4.783778	5.396851	5.37332	10.432	10.405	12.83417	12.81133	66.950897	78.765761		16.18	16.181875					
	7	SINAR SABANG	CON	4.915068	4.783778	4.127004	4.10901	24.662	24.629	32.56599	32.53162	132.32283	155.67392		12.37	12.374375					
	8	SINGAPORE PIONER	OT	1.966027	1.913511	2.857157	2.844699	11.365	11.346	14.761	14.74299	61.796174	72.701381		8.57	8.566875					
	9	KUNIANG	BC	12.77918	12.43782	6.349237	6.321553	37.941	37.890	50.10153	50.04865	213.86929	251.61092	0	19.04	19.0375					
	10	Ict IRIS MANDIRI	LC	2.949041	2.870267	3.809542	3.792932	7.364	7.344	9.059415	9.04329	46.23252	54.3912		11.42	11.4225					
	11	SEASPAN SANTOS	CON	10.81315	10.52431	7.301622	7.269786	43.632	43.574	57.61675	57.55595	238.28759	280.33834		21.89	21.893125					
	12	TB. ANTASENA	TUG	7.864108	7.654044	4.761928	4.741165	9.205	9.180	11.32427	11.30411	66.034668	77.687845		14.28	14.278125					
	13	MULTI SPIRIT	GC	5.898081	5.740533	4.127004	4.10901	18.570	18.542	24.25959	24.23139	105.47777	124.0915	13.361	12.37	25.735375					
	14	INTREPRID SEAHAWK	OT	4.915068	4.783778	3.809542	3.792932	22.765	22.734	30.06092	30.02919	122.89022	144.57673		11.42	11.4225					
	15	MENTARI KRISTAL	GC	21.6263	21.04862	9.206393	9.166252	23.832	23.781	30.12529	30.0802	168.86615	198.66606		27.60	27.604375					
	16																				
	17																TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1888.8641	2233.0756			209.231	2066.7104	2442.3066	2020	-422.30658	-20.906267

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Sunday, 08 October 2017	1	KEDUNG MAS	CON	5.898081	5.740533	4.761928	4.741165	8.753	8.729	10.70785	10.68815	60.018989	70.610575	16.70125	14.28	30.979375					
	2	TANTO ABADI	CON	17.69424	17.2216	7.936546	7.901942	47.427	47.363	62.62691	62.56081	270.7312	318.5073	0	23.80	23.796875					
	3	IRIS MANDIRI	LC	4.915068	4.783778	3.809542	3.792932	7.364	7.344	9.059415	9.04329	50.112058	58.955362		11.42	11.4225					
	4	SPIL CITRA	CON	14.7452	14.35133	7.619084	7.585864	45.529	45.468	60.12183	60.05838	255.47928	300.56386	0	22.85	22.845					
	5	ANGGRAINI EXCELLENT	OT	2.949041	2.870267	3.174618	3.160777	11.142	11.123	14.37579	14.35728	63.152607	74.297185		9.52	9.51875					
	6	ORIENTAL EMERALD	CON	1.966027	1.913511	2.857157	2.844699	12.074	12.055	15.72825	15.70952	65.14807	76.644788		8.57	8.566875					
	7	OOCL NORFOLK	CON	3.932054	3.827022	3.49208	3.476854	20.868	20.840	27.55584	27.52676	111.51783	131.19745		10.47	10.470625					
	8	MAGELAN	CON	19.66027	19.13511	10.15878	10.11449	38.170	38.104	49.43095	49.36918	234.14277	275.46208		30.46	30.46					
	9	MUTIARA PERSADA 3	PAS	14.7452	14.35133	7.301622	7.269786	40.466	40.410	53.29954	53.24194	231.08589	271.86575	0	21.89	21.893125					
	10	KURAU	OT	12.77918	12.43782	6.98416	6.953709	24.777	24.734	31.98692	31.94593	152.59845	179.52759	0	20.94	20.94125					
	11	ORIENTAL GOLD	CON	8.847122	8.6108	6.349237	6.321553	30.401	30.355	39.81885	39.77361	170.47683	200.56098		19.04	19.0375					
	12	HANTON TRADER 1	BC	2.949041	2.870267	3.174618	3.160777	18.971	18.945	25.05076	25.02433	100.14545	117.81818		9.52	9.51875					
	13	BBC NEWYORK	GC	0.983014	0.956756	2.539695	2.528621	15.176	15.156	20.04061	20.01946	77.400684	91.059629		7.62	7.615					
	14	TANTO SELALU	CON	13.76219	13.39458	6.666699	6.637631	18.607	18.569	23.65502	23.62101	124.91347	146.95702		19.99	19.989375					
	15																TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1966.9236	2314.0277			247.055	2176.9203	2561.0827	1960	-601.08275	-30.667487

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Monday, 09 October 2017	1	AS COSTANTINA	CON	14.7452	14.35133	9.523855	9.48233	56.912	56.835	75.15229	75.07298	312.07497	367.14702	8.350625	28.56	36.906875					
	2	INTAN JAYA	GC	2.949041	2.870267	3.809542	3.792932	7.364	7.344	9.059415	9.04329	46.23252	55.701831	20.0415	11.42	31.464					
	3	LUMOSO SELAMAT	CON	0.983014	0.956756	2.539695	2.528621	6.130	6.116	7.704674	7.692687	34.65199	41.749385	0	7.62	7.615					
	4	MENTARI PERKASA	GC	0.983014	0.956756	2.222233	2.212544	4.295	4.284	5.284659	5.275253	25.514143	30.739932	0	6.66	6.663125					
	5	GH LESTE	CON	4.915068	4.783778	5.079389	5.057243	30.353	30.312	40.08122	40.03892	160.62068	193.51889	0	15.23	15.23					
	6	SITU MAS	CON	38.33753	37.31346	15.87309	15.80388	94.853	94.725	125.2538	125.1216	547.28171	659.37556	0	47.59	47.59375					
	7	MARINA STAR 2	CON	2.949041	2.870267	4.444466	4.425087	19.131	19.100	24.94151	24.91202	102.77315	123.82308	0	13.33	13.32625					
	8	KAMILA	CON	28.50739	27.74591	12.69847	12.64311	24.545	24.481	30.19805	30.1443	190.96401	230.07712	0	38.08	38.075					
	9	TOMINI DIGNITY	BC	13.76219	13.39458	9.206393	9.166252	55.015	54.941	72.64721	72.57054	300.70258	362.29227	0	27.60	27.604375					
	10	NIKI BAROKAH	PAS	23.59232	22.96213	8.57147	8.534097	16.568	16.525	20.38368	20.3474	137.48419	165.6436	0	25.70	25.700625					
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1858.2999	2230.0687			250.179	2070.9521	2480.2477	1920	-560.24768	-29.179567

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Tuesday, 10 October 2017	1	MERATUS SABANG	GC	5.898081	5.740533	4.127004	4.10901	10.210	10.188	12.85948	12.83974	65.972053	77.61418	10.02075	12.37	22.395125					
	2	RED ROVER	GC	1.966027	1.913511	2.857157	2.844699	11.749	11.730	15.28542	15.26702	63.613495	74.839406		8.57	8.566875					
	3	MERATUS KENDARI I	GC	1.966027	1.913511	3.49208	3.476854	6.872	6.854	8.470189	8.455285	41.499285	48.822688		10.47	10.470625					
	4	SPIL HAPSRI	CON	29.49041	28.70267	11.74609	11.69487	20.959	20.901	25.553	25.50505	174.55219	205.35551	0	35.22	35.219375					
	5	OCEAN SUKSES	BC	4.915068	4.783778	5.079389	5.057243	30.353	30.312	40.08122	40.03892	160.62068	188.9655		15.23	15.23					
	6	AS SHOUMIA	CON	2.949041	2.870267	3.49208	3.476854	8.663	8.644	10.91367	10.89695	51.906655	61.066652		10.47	10.470625					
	7	MULIA KARSA I	OT	28.50739	27.74591	11.42863	11.3788	31.068	31.004	39.42008	39.36261	219.91553	258.72416	0	34.27	34.2675					
	8	TIMUR LAUT MAS	OT	6.881095	6.697289	4.444466	4.425087	14.834	14.807	19.08211	19.05697	90.227183	106.14963		13.33	13.32625					
	9	HIJAU SEJUK	CON	4.915068	4.783778	4.127004	4.10901	9.187	9.165	11.46396	11.44527	59.196308	69.642715		12.37	12.374375					
	10	AYER MAS	GC	16.71123	16.26484	8.254008	8.218019	15.955	15.913	19.62873	19.5938	120.53803	141.80945	0	24.75	24.74875					
	11	MENTARI SEJAHTERA	GC	15.72822	15.30809	10.15878	10.11449	21.118	21.065	26.17829	26.13379	145.80443	171.53462	0	30.46	30.46					
	12	TIGER SUMMER	OT	3.932054	3.827022	4.127004	4.10901	8.208	8.187	10.12869	10.11099	52.629311	61.916836		12.37	12.374375					
	13	LAGUN MAS	GC	4.915068	4.783778	3.809542	3.792932	7.364	7.344	9.059415	9.04329	50.112058	58.955362		11.42	11.4225					
	14	MERATUS BENOA	GC	11.79616	11.48107	6.666699	6.637631	12.886	12.853	15.85398	15.82576	94.000351	110.58865		19.99	19.989375					
	15																TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1390.5876	1635.9854			261.31575	1612.7059	1897.3011	2120	222.69889	10.504665

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Wednesday, 11 October 201	1	PULAU HOKI	CON	16.71123	16.26484	7.619084	7.585864	14.727	14.689	18.11883	18.08658	113.8025	133.88529	7.7939167	22.85	30.638917					
	2	KAMILIA	CON	14.7452	14.35133	5.714313	5.689398	11.045	11.017	13.58912	13.56494	89.716355	105.54865	5.5670833	17.13	22.700833					
	3	HS CHOPIN	CON	7.864108	7.654044	6.349237	6.321553	37.503	37.452	49.50377	49.45134	202.099	237.76353	8.9073333	19.04	27.944833					
	4	WARNOW CHIEF	CON	7.864108	7.654044	5.396851	5.37332	17.169	17.136	22.02068	21.99101	104.60492	123.06462	0	16.18	16.181875					
	5	KGM HOTEL	OT	0.983014	0.956756	3.809542	3.792932	7.364	7.344	9.059415	9.04329	42.352982	49.827038	0	11.42	11.4225					
	6	HIJAU SEJUK	CON	4.915068	4.783778	3.809542	3.792932	7.364	7.344	9.059415	9.04329	50.112058	58.955362	0	11.42	11.4225					
	7	LAGUN MAS	GC	7.864108	7.654044	4.761928	4.741165	9.205	9.180	11.32427	11.30411	66.034668	77.687845	0	14.28	14.278125					
	8	AYER MAS	GC	5.898081	5.740533	4.127004	4.10901	7.977	7.956	9.814366	9.796898	55.419595	65.199523	0	12.37	12.374375					
	9	HAPPY STAR I	CON	5.898081	5.740533	4.761928	4.741165	9.205	9.180	11.32427	11.30411	62.15513	73.123683	0	14.28	14.278125					
	10	MARINA STAR 2	CON	19.66027	19.13511	8.57147	8.534097	16.788	16.744	20.68278	20.64627	130.76158	153.83715	0	25.70	25.700625					
	11	FRISIA NUERNRBERG	CON	7.864108	7.654044	5.079389	5.057243	9.818	9.793	12.07922	12.05772	69.402436	81.649925	9.4640417	15.23	24.694042					
	12	ORIENTAL MUTIARA	GC	26.54136	25.8324	11.74609	11.69487	26.094	26.032	32.55498	32.50183	192.9974	227.05576	0	35.22	35.219375					
	13	PALUNG MAS	CON	12.77918	12.43782	7.301622	7.269786	14.114	14.077	17.36388	17.33297	102.67566	120.79489	0	21.89	21.893125					
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1179.4586	1387.5984			246.85613	1389.2863	1634.4545	2020	385.54549	19.08641

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Thursday, 12 October 2017	1	RELIANCE	GC	11.79616	11.48107	6.666699	6.637631	12.886	12.853	15.85398	15.82576	94.000351	110.58865	1.670125	19.99	21.6595					
	2	KANAL MAS	CON	1.966027	1.913511	3.174618	3.160777	6.136	6.120	7.549513	7.536075	37.557216	44.184959	0	9.52	9.51875					
	3	AYER MAS	GC	10.81315	10.52431	5.714313	5.689398	11.045	11.017	13.58912	13.56494	81.957279	96.420328	0	17.13	17.13375					
	4	ATLANTIK STAR 6	OT	3.932054	3.827022	3.809542	3.792932	7.364	7.344	9.059415	9.04329	48.172289	56.673281	0	11.42	11.4225					
	5	FRISIA NORDBERG	CON	5.898081	5.740533	4.127004	4.10901	13.150	13.125	16.86771	16.845	79.862107	93.955421	0	12.37	12.374375					
	6	EVER ABLE	CON	0.983014	0.956756	1.904771	1.896466	3.982	3.972	4.939068	4.930701	23.564964	27.723487	0	5.71	5.71125					
	7	MSC LUCIA	CON	0.983014	0.956756	2.539695	2.528621	7.587	7.572	9.690701	9.677239	41.534324	48.863911	0	7.62	7.615					
	8	CSCL KINGSTONE	CON	0.983014	0.956756	3.174618	3.160777	11.015	10.995	14.20226	14.18388	58.671744	69.025581	0	9.52	9.51875					
	9	WARNOW CHIEF	CON	6.881095	6.697289	6.031775	6.005476	15.747	15.714	19.91885	19.88917	96.884667	113.98196	0	18.09	18.085625					
	10	NORD PLUTO	BC	11.79616	11.48107	6.666699	6.637631	29.311	29.265	38.25107	38.20621	171.61476	201.89972	16.70125	19.99	36.690625					
	11	ASIA PESONA	GC	6.881095	6.697289	4.761928	4.741165	9.205	9.180	11.32427	11.30411	64.094899	75.405764	0	14.28	14.278125					
	12	PULAU HOKI	CON	23.59232	22.96213	9.841317	9.798408	19.023	18.973	23.40349	23.36183	150.95526	177.59442	0	29.51	29.508125					
	13	SINAR JEPARA	CON	26.54136	25.8324	10.7937	10.74664	20.864	20.809	25.66834	25.62266	166.87787	196.3269	0	32.36	32.36375					
	14	MENTARI SEJAHTERA	GC	8.847122	8.6108	6.031775	6.005476	11.659	11.629	14.34407	14.31854	81.445508	95.818245	0	18.09	18.085625					
	15																TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1197.1932	1408.4626			243.96575	1404.5641	1652.4284	2060	407.57163	19.78503

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Friday, 13 October 2017	1	MUNDU	OT	19.66027	19.13511	8.888931	8.850175	17.182	17.137	21.13864	21.10101	133.09288	156.57986	0	26.65	26.6525						
	2	MERATUS KARIMATA	CON	27.52438	26.78915	11.11116	11.06272	21.477	21.421	26.42329	26.37626	172.1854	202.57106	0	33.32	33.315625						
	3	KIRANA	RO	8.847122	8.6108	5.079389	5.057243	10.641	10.615	13.20176	13.17943	75.232237	88.508515	0	15.23	15.23						
	4	SINAR SUMBA	CON	14.7452	14.35133	6.98416	6.953709	27.157	27.112	35.23215	35.18875	167.72395	197.3223	0	20.94	20.94125						
	5	FATIMA III	GC	3.932054	3.827022	4.127004	4.10901	7.977	7.956	9.814366	9.796898	51.540057	60.635361	0	12.37	12.374375						
	6	SOPHIA	BC	15.72822	15.30809	7.301622	7.269786	14.114	14.077	17.36388	17.33297	108.49496	127.64113	0	21.89	21.893125						
	7	ORIENTAL GALAXY	CON	8.847122	8.6108	8.888931	8.850175	26.891	26.839	34.37796	34.3305	157.63471	185.45259	0	26.65	26.6525						
	8	MERATUS SABANG	GC	7.864108	7.654044	5.079389	5.057243	8.739	8.714	10.60717	10.58677	64.301231	75.648507	0	15.23	15.23						
	9	HOSANA VII	TUG	0.983014	0.956756	2.857157	2.844699	5.523	5.508	6.794561	6.782468	32.249679	37.940799	0	8.57	8.566875						
	10	TOMINI DIGNITY	BC	9.830135	9.567555	5.714313	5.689398	28.102	28.060	36.84782	36.80636	160.61771	188.96201	0	17.13	17.13375						
	11	SPIL NIRMALA	CON	5.898081	5.740533	4.444466	4.425087	19.452	19.421	25.37992	25.35011	110.11171	129.54319	0	13.33	13.32625						
	12	MUTIARA PERSADA 3	PAS	0.983014	0.956756	2.539695	2.528621	5.216	5.203	6.45784	6.44678	30.331238	35.68381	0	7.62	7.615						
	13	MERATUS SABANG	GC	32.43945	31.57293	13.96832	13.90742	24.031	23.963	29.16972	29.1136	198.16584	233.13629	0	41.88	41.8825						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1461.6816	1719.6254			260.81375	1683.3733	1980.4392	2266	285.56082	12.601978	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Saturday, 14 October 2017	1	MAHAKAMAH I	OT	14.7452	14.35133	7.619084	7.585864	38.336	38.280	50.31233	50.25617	221.48565	260.57136	8.9073333	22.85	31.752333						
	2	FATIMA III	GC	14.7452	14.35133	7.619084	7.585864	14.727	14.689	18.11883	18.08658	109.92296	129.32113	4.2309833	22.85	27.075983						
	3	INTAN DAYA 17	GC	7.2743	7.079991	4.57145	4.551518	14.474	14.447	18.55958	18.53452	89.492971	105.28585	0	13.71	13.707						
	4	MENTARI TRADER	GC	0.983014	0.956756	2.539695	2.528621	4.909	4.896	6.03961	6.02886	28.881911	33.978719	0	7.62	7.615						
	5	Tb. LLB SUKSES 08	TUG	9.830135	9.567555	6.349237	6.321553	12.273	12.241	15.09903	15.07215	86.753045	102.06241	0	19.04	19.0375						
	6	SINAR SUMBA	CON	18.67726	18.17835	8.57147	8.534097	50.574	50.506	66.75573	66.685	288.48205	339.39064	2.7835417	25.70	28.484167						
	7	WAN HAI 216	CON	9.830135	9.567555	5.714313	5.689398	25.687	25.648	33.55529	33.51627	149.20786	175.53865	0	17.13	17.13375						
	8	TANTO SEMANGAT	CON	10.81315	10.52431	9.206393	9.166252	28.738	28.684	36.81564	36.76558	170.71329	200.83916	0	27.60	27.604375						
	9	MARTINE	BC	10.81315	10.52431	6.98416	6.953709	41.735	41.679	55.11168	55.05352	228.85498	269.24115	0	20.94	20.94125						
	10	LEGUNDI	RO	7.864108	7.654044	4.761928	4.741165	11.778	11.752	14.83328	14.81051	78.194711	91.993777	0	14.28	14.278125						
	11	ORIENTAL GALAXY	CON	6.881095	6.697289	4.444466	4.425087	20.012	19.981	26.14345	26.11306	114.69739	134.9381	0	13.33	13.32625						
	12	PASIFIC 88	LCT	3.932054	3.827022	3.49208	3.476854	10.305	10.285	13.15203	13.13365	61.603187	72.474338	0	10.47	10.470625						
	13	LUNA BLUE	GC	3.932054	3.827022	4.761928	4.741165	10.361	10.337	12.9019	12.88057	63.742688	74.991398	0	14.28	14.278125						
	14	PULAU NUNUKAN	GC	6.881095	6.697289	4.444466	4.425087	8.591	8.568	10.56932	10.55051	60.727132	71.443684	0	13.33	13.32625						
	15	NORD PLUTO	BC	4.915068	4.783778	3.809542	3.792932	22.765	22.734	30.06092	30.02919	122.89022	144.57673	0	11.42	11.4225						
	16	TANTO SEPAKAT	GC	0.983014	0.956756	2.857157	2.844699	4.873	4.859	5.907904	5.896469	29.177076	34.325972	0	8.57	8.566875						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1904.8271	2240.9731			279.02011	2141.9942	2519.9932	2146	-373.99317	-17.427454	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Sunday, 15 October 2017	1	DEVA	CON	11.79616	11.48107	7.619084	7.585864	45.529	45.468	60.12183	60.05838	249.65997	293.71762	11.134167	22.85	33.979167						
	2	SINAR AMBON	GC	13.76219	13.39458	6.98416	6.953709	24.216	24.173	31.22183	31.18141	151.88691	178.69048	6.6805	20.94	27.62175						
	3	DONG HAE STAR	BC	11.79616	11.48107	6.666699	6.637631	39.838	39.785	52.6066	52.55108	221.36213	260.42604	0	19.99	19.989375						
	4	SUMBER 5	TUG	24.57534	23.91889	10.47624	10.43056	20.250	20.197	24.91339	24.86905	159.63056	187.80066	0	31.41	31.411875						
	5	KITRAN 31	OT	14.7452	14.35133	8.254008	8.218019	14.721	14.680	17.94606	17.91237	110.82741	130.38518	0	24.75	24.74875						
	6	SMB II	LPG	11.79616	11.48107	6.98416	6.953709	19.609	19.569	24.93964	24.90389	126.23719	148.51435	0	20.94	20.94125						
	7	GENCO LOIRE	BC	2.949041	2.870267	4.761928	4.741165	28.456	28.418	37.57614	37.53649	147.30852	173.30415	0	14.28	14.278125						
	8	RORO PRAYESTI	RO	11.79616	11.48107	7.619084	7.585864	35.874	35.820	46.9559	46.90223	204.03502	240.0412	0	22.85	22.845						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1370.9477	1612.8797			195.81529	1537.3907	1808.695	1666	-142.69496	-8.5651236	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Monday, 16 October 2017	1	GRESIK - SURABAYA		0	0							0	0	0	0.00	0						
	2	FLORES SEA	GC	8.847122	8.6108	10.47624	10.43056	38.946	38.880	50.40857	50.34529	216.94471	255.22907	2.7835417	31.41	34.195417						
	3	NORD VILAN	CON	8.847122	8.6108	12.38101	12.32703	23.932	23.869	29.4431	29.39069	148.80086	175.05984	0	37.12	37.123125						
	4	SERASI I	RO	6.881095	6.697289	8.254008	8.218019	19.292	19.248	24.17993	24.14162	116.91198	137.54351	0	24.75	24.74875						
	5	SINAR SABANG	CON	6.881095	6.697289	2.539695	2.528621	15.176	15.156	20.04061	20.01946	89.039298	104.75212	0	7.62	7.615						
	6	SAVIOUR	GC	7.864108	7.654044	13.65086	13.59134	30.242	30.170	37.72054	37.65885	178.55185	210.061	0	40.93	40.930625						
	7	NAJADE	CON	8.847122	8.6108	5.396851	5.37332	32.250	32.207	42.5863	42.54135	177.81237	209.19102	0	16.18	16.181875						
	8	HIJAU JELITA	CON	15.72822	15.30809	8.254008	8.218019	31.291	31.238	40.54206	40.49158	191.07086	224.78925	0	24.75	24.74875						
	9	ORIENTAL EMERALD	CON	2.949041	2.870267	4.127004	4.10901	15.139	15.113	19.58044	19.55572	83.44344	98.168753	0	12.37	12.374375						
	10	NAVIGATOR ARIES	LPG	10.81315	10.52431	7.301622	7.269786	43.632	43.574	57.61675	57.55595	238.28759	280.33834	0	21.89	21.893125						
	11	CSCL SANTIAGO	CON	14.7452	14.35133	7.619084	7.585864	45.529	45.468	60.12183	60.05838	255.47928	300.56386	0	22.85	22.845						
	12	KOTA NASRAT	CON	6.881095	6.697289	4.761928	4.741165	28.456	28.418	37.57614	37.53649	155.0676	182.43247	0	14.28	14.278125						
	13	MERATUS BANJAR 1	CON	6.881095	6.697289	9.523855	9.48233	15.714	15.668	18.97322	18.93564	101.87506	119.85301	0	28.56	28.55625						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1953.2849	2297.9822			285.49042	2195.9518	2583.4727	2174	-409.47266	-18.834989	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Tuesday, 17 October 2017	1	NORTHERN VIVACITY	CON	6.881095	6.697289	4.444466	4.425087	26.559	26.523	35.07107	35.03406	145.63498	171.33528	25.051875	13.33	38.378125						
	2	GULF MAS	CON	3.932054	3.827022	3.49208	3.476854	8.460	8.441	10.63559	10.61908	52.882774	62.215029	0	10.47	10.470625						
	3	TRIFOSA	GC	10.81315	10.52431	6.666699	6.637631	28.335	28.290	36.92007	36.87621	165.06259	194.19128	0	19.99	19.989375						
	4	MULTI SPIRIT	GC	7.864108	7.654044	4.761928	4.741165	9.205	9.180	11.32427	11.30411	66.034668	77.687845	0	14.28	14.278125						
	5	MENTARI SELARAS	CON	1.966027	1.913511	2.857157	2.844699	5.106	5.092	6.22632	6.214648	32.220276	37.906207	0	8.57	8.566875						
	6	KOTA NASTRAT	CON	7.864108	7.654044	5.079389	5.057243	30.353	30.312	40.08122	40.03892	166.43998	195.81174	0	15.23	15.23						
	7	NAVIGATOR ARIES	LPG	30.47342	29.65942	12.06355	12.01095	72.088	71.991	95.1929	95.09244	418.57219	492.43787	0	36.17	36.17125						
	8	MUTIA LADJONI 7	GC	6.881095	6.697289	4.444466	4.425087	8.565	8.542	10.53346	10.51467	60.602862	71.297485	0	13.33	13.32625						
	9	NORD VILAN	CON	21.6263	21.04862	9.206393	9.166252	35.986	35.926	46.69846	46.64107	226.29848	266.23351	0	27.60	27.604375						
	10	TANTO HANDAL	GC	27.52438	26.78915	13.3334	13.27526	29.405	29.335	36.66096	36.60084	212.92382	250.49862	0	39.98	39.97875						
	16																					
	17																TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1546.6726	1819.6149			223.99375	1737.0673	2043.6086	1870	-173.60861	-9.283883	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Wednesday, 18 October 201	1	MSC GIANNA	CON			4.444466	4.425087	26.559	26.523	35.07107	35.03406	132.0566	155.36071		13.33	13.32625						
	2	TANTO SUBUR 2	CON	2.949041	2.870267	3.809542	3.792932	14.288	14.264	18.5021	18.47896	78.954991	92.888225		11.42	11.4225						
	3	MARTINE	BC	0.983014	0.956756	2.539695	2.528621	15.176	15.156	20.04061	20.01946	77.400684	91.059629		7.62	7.615						
	4	ALIDRA	CON	7.864108	7.654044	5.079389	5.057243	30.353	30.312	40.08122	40.03892	166.43998	195.81174	0	15.23	15.23						
	5	STAR HIDRA	GC	2.949041	2.870267	4.761928	4.741165	28.456	28.418	37.57614	37.53649	147.30852	173.30415		14.28	14.278125						
	6	MERATUS BONTANG	GC	6.881095	6.697289	4.444466	4.425087	9.998	9.975	12.48866	12.46842	67.37838	79.268682		13.33	13.32625						
	7	RED ROCK	GC	9.830135	9.567555	5.396851	5.37332	21.624	21.589	28.09677	28.06259	129.54043	152.4005		16.18	16.181875						
	8	MERATUS KARIANGAU	CON	4.915068	4.783778	3.809542	3.792932	14.219	14.195	18.40819	18.38512	82.509119	97.069551		11.42	11.4225						
	9	ARGO	CON	3.932054	3.827022	3.809542	3.792932	22.765	22.734	30.06092	30.02919	120.95045	142.29465		11.42	11.4225						
	10	MENTARI SELARAS	CON	17.69424	17.2216	7.936546	7.901942	22.489	22.444	28.62111	28.58027	152.88821	179.86848		23.80	23.796875						
	11	TANTO SUBUR 2	CON	24.57534	23.91889	10.15878	10.11449	38.102	38.037	49.33892	49.27722	243.52272	286.49731	0	30.46	30.46						
	12	KISIK MAS	CON	7.864108	7.654044	4.761928	4.741165	20.230	20.198	26.35941	26.32808	118.13712	138.98485		14.28	14.278125						
	13	TANTO SENTOSA	CON	2.949041	2.870267	3.809542	3.792932	16.003	15.978	20.84069	20.81582	87.059113	102.42249		11.42	11.4225						
	14	SINAR MOROTAI	OT	13.76219	13.39458	6.666699	6.637631	39.838	39.785	52.6066	52.55108	225.24167	264.9902	0	19.99	19.989375						
	15	SINAR BELAWAN	CON	11.79616	11.48107	7.619084	7.585864	45.529	45.468	60.12183	60.05838	249.65997	293.71762		22.85	22.845						
	16	SINAR MOROTAI	OT	4.915068	4.783778	3.809542	3.792932	14.616	14.592	18.94923	18.92576	84.384028	99.275328		11.42	11.4225						
	17	MSC GIANNA	CON	1.966027	1.913511	2.857157	2.844699	17.074	17.051	22.54569	22.52189	88.773068	104.4389		8.57	8.566875						
	18	LINTAS BATANG HARI	GC	5.898081	5.740533	5.714313	5.689398	11.321	11.292	13.96468	13.94022	73.559897	86.541055		17.13	17.13375						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												2325.765	2736.1941			274.14	2558.784	3010.3341	2260	-750.33407	-33.200622	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Thursday, 19 October 2017	1	WARNOW CHIEF	CON	3.932054	3.827022	3.809542	3.792932	22.765	22.734	30.06092	30.02919	120.95045	141.29725	0	11.42	11.4225						
	2	SENDANG MAS	CON	17.69424	17.2216	9.523855	9.48233	56.912	56.835	75.15229	75.07298	317.89427	373.99326		28.56	28.55625						
	3	MENTAYA RIVER	GC	19.66027	19.13511	8.57147	8.534097	26.659	26.609	34.1445	34.09799	177.41154	208.71946	0	25.70	25.700625						
	4	SERENA III	OT	17.69424	17.2216	7.936546	7.901942	31.438	31.386	40.82438	40.77448	195.17719	229.62022	0	23.80	23.796875						
	5	KGM GOLF	TUG	9.830135	9.567555	6.98416	6.953709	13.500	13.465	16.60893	16.57937	93.488581	109.98657		20.94	20.94125						
	6	NORTHERN DEMOCRAT	CON	7.864108	7.654044	5.396851	5.37332	32.250	32.207	42.5863	42.54135	175.8726	206.90894		16.18	16.181875						
	7	UNI AMPLE	CON	0.983014	0.956756	2.539695	2.528621	15.176	15.156	20.04061	20.01946	77.400684	91.059629		7.62	7.615						
	8	GRIYA DAYAK	OT	6.881095	6.697289	4.444466	4.425087	12.477	12.451	15.86794	15.84519	79.088865	93.045723	0	13.33	13.32625						
	9	STRAIT MAS	CON	6.881095	6.697289	4.444466	4.425087	21.258	21.226	27.84205	27.81041	120.58371	141.86319		13.33	13.32625						
	10	SINAR AMBON	GC	7.864108	7.654044	5.079389	5.057243	12.186	12.159	15.30842	15.28452	80.59283	94.815094		15.23	15.23						
	11	CURUG MAS	CON	1.966027	1.913511	2.857157	2.844699	8.211	8.194	10.46003	10.44521	46.891685	55.166688		8.57	8.566875						
	12	UMSINI	PAS	0.983014	0.956756	2.539695	2.528621	15.176	15.156	20.04061	20.01946	77.400684	91.059629		7.62	7.615						
	13	TB. GLOBAL MANDIRI V	TUG	1.966027	1.913511	3.49208	3.476854	6.750	6.732	8.304464	8.289683	40.924983	48.147039		10.47	10.470625						
	14	NAVIGATOR GLOBAL	LPG	2.949041	2.870267	4.761928	4.741165	28.456	28.418	37.57614	37.53649	147.30852	173.30415		14.28	14.278125						
	15	BINTANG JIASIA 35	CON	17.69424	17.2216	12.06355	12.01095	33.812	33.744	42.99832	42.93663	212.48118	249.97786		36.17	36.17125						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1963.4678	2308.9647			253.19875	2178.6867	2563.1608	2220	-343.16084	-15.457696	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Friday, 20 October 2017	1	HIJAU TERANG	GC	8.847122	8.6108	7.619084	7.585864	45.529	45.468	60.12183	60.05838	243.84067	286.87137	20.0415	22.85	42.8865						
	2	MITRA SEJATRAH	TUG	23.59232	22.96213	9.841317	9.798408	19.023	18.973	23.40349	23.36183	150.95526	177.59442	0	29.51	29.508125						
	3	LAGUN MAS	GC	6.881095	6.697289	3.49208	3.476854	8.840	8.821	11.15452	11.13763	60.50037	71.176906		10.47	10.470625						
	4	SENDANG MAS	CON	5.898081	5.740533	5.714313	5.689398	34.147	34.101	45.09137	45.04379	181.42567	213.44197		17.13	17.13375						
	5	PALUNG MAS	CON	7.864108	7.654044	5.396851	5.37332	11.590	11.562	14.41356	14.38954	78.243374	92.051028		16.18	16.181875						
	6	SELATAN DAMAI	OT	2.949041	2.870267	4.444466	4.425087	17.912	17.883	23.28041	23.25215	97.016794	114.1374		13.33	13.32625						
	7	WAN HAI 216	CON	22.60931	22.00538	10.47624	10.43056	62.603	62.519	82.66752	82.58027	355.89096	418.69525	0	31.41	31.411875						
	8	MUTIARA PERSADA 3	PAS	29.49041	28.70267	12.06355	12.01095	72.088	71.991	95.1929	95.09244	416.63242	490.15579	0	36.17	36.17125						
	9	MUARA MAS	CON	0.983014	0.956756	2.539695	2.528621	7.447	7.432	9.500331	9.48701	40.874621	48.087789		7.62	7.615						
	10	SURYA PEKIK	GC	3.932054	3.827022	5.396851	5.37332	32.250	32.207	42.5863	42.54135	168.11352	197.78061		16.18	16.181875						
	11	MENTARI	LCT	0.983014	0.956756	2.857157	2.844699	4.662	4.648	5.620894	5.609672	28.182476	33.155854		8.57	8.566875						
	12	GUNUNG DEMPO	PAS	6.881095	6.697289	4.444466	4.425087	26.559	26.523	35.07107	35.03406	145.63498	171.33528	8.350625	13.33	21.676875						
	13	HIJAU TERANG	GC	28.50739	27.74591	11.42863	11.3788	68.294	68.202	90.18275	90.08757	395.82742	465.67932	0	34.27	34.2675						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												2363.1385	2780.163			285.39838	2605.7272	3065.5614	1966	-1099.5614	-55.928859	

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Saturday, 21 October 2017	1	KOTA JUTA	CON	5.898081	5.740533	4.444466	4.425087	26.559	26.523	35.07107	35.03406	143.69522	169.0532		13.33	13.32625					
	2	MILA UTAMA	RO	39.32054	38.27022	15.23817	15.17173	52.335	52.241	67.43809	67.35041	347.36493	408.66463	0	45.69	45.69					
	3	MUTIARA PERSADA III	PAS	3.932054	3.827022	2.222233	2.212544	12.226	12.209	16.09936	16.08192	68.810482	80.953509		6.66	6.663125					
	4	MERATUS PALEMBANG	GC	4.915068	4.783778	4.127004	4.10901	11.534	11.511	14.66498	14.64391	70.289045	82.692994		12.37	12.374375					
	5	TANTO TANGGUH	CON	19.66027	19.13511	8.57147	8.534097	28.817	28.764	37.08593	37.03725	187.60474	220.71146	0	25.70	25.700625					
	6	INTAN DAYA 88	GC	4.915068	4.783778	3.809542	3.792932	17.593	17.566	23.00885	22.98237	98.452155	115.82606		11.42	11.4225					
	7	SINAR SABANG	CON	1.966027	1.913511	2.857157	2.844699	17.074	17.051	22.54569	22.52189	88.773068	104.4389		8.57	8.566875					
	8	NEW LIFE	BC	1.966027	1.913511	2.857157	2.844699	14.968	14.946	19.67441	19.65275	78.822998	92.732939		8.57	8.566875					
	9	ISA EXPRESS	BC	25.55835	24.87564	12.06355	12.01095	72.088	71.991	95.1929	95.09244	408.87334	481.02746		36.17	36.17125					
	10	PALUNG MAS	CON	1.966027	1.913511	2.857157	2.844699	5.120	5.106	6.245974	6.234288	32.288386	37.986336		8.57	8.566875					
	11	CPO NORFOLK	CON	1.966027	1.913511	3.174618	3.160777	18.971	18.945	25.05076	25.02433	98.205682	115.5361		9.52	9.51875					
	12	LINTAS BARITO	GC	25.55835	24.87564	10.47624	10.43056	25.268	25.211	31.75601	31.70658	185.2826	217.97953	20.0415	31.41	51.453375					
	13	CIREMAI	PAS	10.81315	10.52431	5.714313	5.689398	34.147	34.101	45.09137	45.04379	191.12452	224.85237	0	17.13	17.13375					
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1999.5872	2352.4555			255.15463	2216.4686	2607.6101	2040	-567.61011	-27.824025

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Sunday, 22 October	1	KIRANA IX	RO	7.864108	7.654044	4.761928	4.741165	27.163	27.125	35.81277	35.77442	150.89661	177.52542		14.28	14.278125					
	2	TANTO RAYA	CON	3.932054	3.827022	3.49208	3.476854	9.521	9.501	12.0828	12.06521	57.897873	68.115145		10.47	10.470625					
	3	TANTO TANGGUH	CON	9.830135	9.567555	6.031775	6.005476	20.631	20.594	26.57878	26.54416	125.78318	147.98022	0	18.09	18.085625					
	4	SANTIKA NUSANTARA	RO	2.949041	2.870267	3.174618	3.160777	10.542	10.522	13.5568	13.5389	60.314506	70.958242		9.52	9.51875					
	5	PRATIWI RAYA	GC	9.830135	9.567555	5.396851	5.37332	20.727	20.692	26.87341	26.84014	125.30102	147.41297	0	16.18	16.181875					
	6	KMTC NHAVA SHEVA	CON	14.7452	14.35133	6.98416	6.953709	41.735	41.679	55.11168	55.05352	236.61405	278.36947	0	20.94	20.94125					
	7	MERATUS BATAM	CON	7.864108	7.654044	5.396851	5.37332	19.485	19.451	25.17982	25.14781	115.55257	135.9442	6.6805	16.18	22.862375					
	8	SPIL CAYA	CON	4.915068	4.783778	6.98416	6.953709	41.735	41.679	55.11168	55.05352	217.21636	255.54866		20.94	20.94125					
	9	SINAR SABANG	CON	22.60931	22.00538	9.523855	9.48233	56.912	56.835	75.15229	75.07298	327.59312	385.40367		28.56	28.55625					
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1417.1693	1667.258			161.83613	1554.73	1829.0941	1674	-155.09413	-9.264882

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Monday, 23 October 2017	1	EASTGATE	BC	20.64328	20.09187	9.841317	9.798408	58.809	58.730	77.65736	77.57541	333.1462	391.9367		29.51	29.508125						
	2	NORTHERN DIAMOND	CON	5.898081	5.740533	5.714313	5.689398	34.147	34.101	45.09137	45.04379	181.42567	213.44197	0	17.13	17.13375						
	3	GUNUNG DEMPO	PAS	6.881095	6.697289	4.444466	4.425087	26.559	26.523	35.07107	35.03406	145.63498	171.33528	24.495167	13.33	37.821417						
	4	COUGAR	OT	7.864108	7.654044	4.761928	4.741165	15.606	15.578	20.05395	20.02731	96.286339	113.27805	0	14.28	14.278125						
	5	SAWU SEA	GC	11.79616	11.48107	7.619084	7.585864	19.531	19.488	24.6687	24.63159	126.80145	149.17818	0	22.85	22.845						
	6	KANAL MAS	CON	10.81315	10.52431	5.714313	5.689398	11.045	11.017	13.58912	13.56494	81.957279	96.420328		17.13	17.13375						
	7	CSCL SAN JOSE	CON	13.76219	13.39458	7.619084	7.585864	45.529	45.468	60.12183	60.05838	253.53951	298.28178	0	22.85	22.845						
	8	KABOGA BARU II	CON	14.7452	14.35133	7.301622	7.269786	14.114	14.077	17.36388	17.33297	106.55519	125.35905	0	21.89	21.893125						
	9	PEDHOULAS FARMER	BC	1.966027	1.913511	3.49208	3.476854	20.868	20.840	27.55584	27.52676	107.6383	126.63329		10.47	10.470625						
	10	Tb. GLOBAL MANDIRI	TUG	4.915068	4.783778	3.809542	3.792932	7.364	7.344	9.059415	9.04329	50.112058	58.955362		11.42	11.4225						
	11	SURABAYA-GRESIK		14.04305	14.0013							28.04435	32.993353		5.71	5.71125						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1511.1413	1777.8133			211.06267	1690.5446	1988.876	1766	-222.876	-12.620385	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Tuesday, 24 October 2017	1	TRUONG MINH DRAGON	GC	1.966027	1.913511	2.857157	2.844699	6.267	6.252	7.809192	7.796345	37.705528	44.359445	0	8.57	8.566875						
	2	SICHEM MELBOURNE	OT	12.77918	12.43782	8.57147	8.534097	16.568	16.525	20.38368	20.3474	116.14673	136.64321		25.70	25.700625						
	3	SANGGAU	OT	11.79616	11.48107	6.031775	6.005476	17.901	17.866	22.85588	22.82403	116.76146	137.36642	0	18.09	18.085625						
	4	MERATUS BONTANG	GC	13.76219	13.39458	6.666699	6.637631	12.886	12.853	15.85398	15.82576	97.879889	115.15281		19.99	19.989375						
	5	DARYA LOK	BC	3.932054	3.827022	6.666699	6.637631	39.838	39.785	52.6066	52.55108	205.84398	242.16939		19.99	19.989375						
	6	MUARA MAS	CON	22.60931	22.00538	9.523855	9.48233	18.409	18.361	22.64854	22.60823	145.64772	171.35026	0	28.56	28.55625						
	7	SAWU SEA	GC	3.932054	3.827022	3.49208	3.476854	6.750	6.732	8.304464	8.289683	44.804521	52.711201		10.47	10.470625						
	8	MERATUS SABANG	GC	12.77918	12.43782	6.349237	6.321553	12.273	12.241	15.09903	15.07215	92.572352	108.90865		19.04	19.0375						
	9	MERATUS GORONTALO	CON	8.847122	8.6108	5.396851	5.37332	11.420	11.392	14.18132	14.15747	79.378339	93.386281	0	16.18	16.181875						
	10	NORTHERN DIAMOND	CON	10.81315	10.52431	6.031775	6.005476	36.044	35.996	47.59645	47.54622	200.55713	235.94957		18.09	18.085625						
	11	LABOBAR	PAS	9.830135	9.567555	5.396851	5.37332	19.855	19.821	25.68446	25.65207	121.18086	142.56571		16.18	16.181875						
	12	XONNE	BC	3.932054	3.827022	11.42863	11.3788	23.152	23.094	28.62544	28.57599	134.0138	157.66329		34.27	34.2675						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1392.4923	1638.2262			235.11313	1592.3385	1873.3394	2214	340.66064	15.386659	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Wednesday, 25 October 201	1	BERKAH 36	BC	11.79616	11.48107	6.349237	6.321553	12.273	12.241	15.09903	15.07215	90.632583	106.62657	0	19.04	19.0375					
	2	ASIA GLORY	GC	5.898081	5.740533	6.98416	6.953709	13.500	13.465	16.60893	16.57937	85.729505	100.85824		20.94	20.94125					
	3	CAPE MORETON	CON	24.57534	23.91889	10.7937	10.74664	30.922	30.860	39.38425	39.32837	210.52915	247.68135		32.36	32.36375					
	4	MERATUS SABANG	GC	16.71123	16.26484	8.57147	8.534097	16.568	16.525	20.38368	20.3474	123.9058	145.77153	2.7835417	25.70	28.484167					
	5	SMB II	LPG	13.76219	13.39458	6.666699	6.637631	12.886	12.853	15.85398	15.82576	97.879889	115.15281	6.6805	19.99	26.669875					
	6	HUMMING BIRD	LPG	2.949041	2.870267	3.174618	3.160777	6.136	6.120	7.549513	7.536075	39.496985	46.467041		9.52	9.51875					
	7	Tb. PRIME 16	TUG	2.949041	2.870267	3.174618	3.160777	6.136	6.120	7.549513	7.536075	39.496985	46.467041		9.52	9.51875					
	8	VEGA STAR	BC	9.830135	9.567555	5.396851	5.37332	9.592	9.566	11.6896	11.66761	72.683379	85.509857		16.18	16.181875					
	9	PORADO	BC	1.966027	1.913511	2.857157	2.844699	5.523	5.508	6.794561	6.782468	34.189448	40.22288		8.57	8.566875					
	10	PUPUK INDONESIA	LPG	8.847122	8.6108	8.254008	8.218019	15.955	15.913	19.62873	19.5938	105.01988	123.5528		24.75	24.74875					
	11	THOR INFINITY	BC	0.983014	0.956756	3.174618	3.160777	9.101	9.083	11.59282	11.57638	49.629043	58.387109		9.52	9.51875					
	12	RORO PRYASTI	RO	1.966027	1.913511	3.174618	3.160777	6.136	6.120	7.549513	7.536075	37.557216	44.184959		9.52	9.51875					
	13	ASIKE GLOBAL	GC	1.966027	1.913511	2.857157	2.844699	5.523	5.508	6.794561	6.782468	34.189448	40.22288		8.57	8.566875					
	14	TUNAS BARU	BC	0.983014	0.956756	2.539695	2.528621	4.137	4.125	4.987298	4.97733	25.235252	29.688532		7.62	7.615					
	15	HAMBURG PEARL	BC	0.983014	0.956756	2.539695	2.528621	4.909	4.896	6.03961	6.02886	28.881911	33.978719		7.62	7.615					
	16	MARINA 1611	TUG	13.76219	13.39458	6.666699	6.637631	12.886	12.853	15.85398	15.82576	97.879889	115.15281		19.99	19.989375					
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1172.9364	1379.9251			186.51279	1331.4722	1566.4379	2106	539.56208	25.620232

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Thursday, 26 October 2017	1	TIGER ZHEJIANG	BC	18.67726	18.17835	9.841317	9.798408	19.023	18.973	23.40349	23.36183	141.25641	166.18401		29.51	29.508125					
	2	MERATUS KAPUAS	CON	20.64328	20.09187	9.206393	9.166252	17.795	17.749	21.89359	21.85462	138.40041	162.82402	0	27.60	27.604375					
	3	NAVIGATOR ARIES	LPG	5.898081	5.740533	4.444466	4.425087	8.591	8.568	10.56932	10.55051	58.787363	69.161603		13.33	13.32625					
	4	SUNGAI MAS	CON	1.966027	1.913511	4.444466	4.425087	8.591	8.568	10.56932	10.55051	51.028287	60.033278		13.33	13.32625					
	5	MERATUS PEKANBARU	GC	1.966027	1.913511	3.174618	3.160777	6.136	6.120	7.549513	7.536075	37.557216	44.184959		9.52	9.51875					
	6	FELYA	GC	15.72822	15.30809	7.619084	7.585864	14.727	14.689	18.11883	18.08658	111.86273	131.60321		22.85	22.845					
	7	LYOLIA	GC	13.76219	13.39458	10.47624	10.43056	20.250	20.197	24.91339	24.86905	138.2931	162.69777	0	31.41	31.411875					
	8	VALERIE SCHULTE	CON	3.932054	3.827022	3.809542	3.792932	7.364	7.344	9.059415	9.04329	48.172289	56.673281	0	11.42	11.4225					
	9	MITRA PROGRESS III	CON	10.81315	10.52431	6.349237	6.321553	12.273	12.241	15.09903	15.07215	88.692814	104.34449		19.04	19.0375					
	10	MENTARI SUCCESS	GC	5.898081	5.740533	4.444466	4.425087	8.591	8.568	10.56932	10.55051	58.787363	69.161603	12.804292	13.33	26.130542					
	11	ORIENTAL GALAXY	CON	24.57534	23.91889	10.47624	10.43056	20.250	20.197	24.91339	24.86905	159.63056	187.80066	0	31.41	31.411875					
	12	PELANGI MAS	OT	1.966027	1.913511	2.857157	2.844699	5.523	5.508	6.794561	6.782468	34.189448	40.22288		8.57	8.566875					
	13	AS MARINE	CON	9.830135	9.567555	6.349237	6.321553	12.273	12.241	15.09903	15.07215	86.753045	102.06241		19.04	19.0375					
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%
TOTAL												1153.411	1356.9542			263.14742	1377.0863	1620.1016	2114	493.89842	23.363218

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Friday, 27 October 2017	1	DARYA LOK	BC	1.966027	1.913511	2.857157	2.844699	5.523	5.508	6.794561	6.782468	34.189448	40.22288		8.57	8.566875						
	2	SPIL NINGSIH	CON	5.898081	5.740533	4.761928	4.741165	9.205	9.180	11.32427	11.30411	62.15513	73.123683		14.28	14.278125						
	3	PRATIWI RAYA	GC	14.7452	14.35133	6.98416	6.953709	13.500	13.465	16.60893	16.57937	103.18743	121.39697		20.94	20.94125						
	4	MERATUS KAPUAS	CON	15.72822	15.30809	8.57147	8.534097	16.568	16.525	20.38368	20.3474	121.96603	143.48945	0	25.70	25.700625						
	5	KURAU	OT	5.898081	5.740533	4.444466	4.425087	8.591	8.568	10.56932	10.55051	58.787363	69.161603		13.33	13.32625						
	6	SEMPATI	TUG	0.983014	0.956756	1.904771	1.896466	3.682	3.672	4.529708	4.521645	22.146376	26.054559		5.71	5.71125						
	7	TIGA RODA	BC	8.847122	8.6108	6.031775	6.005476	11.659	11.629	14.34407	14.31854	81.445508	95.818245		18.09	18.085625						
	8	MAIDEN ENERGY	OT	20.64328	20.09187	10.47624	10.43056	20.250	20.197	24.91339	24.86905	151.87148	178.67234	0	31.41	31.411875						
	9	MUTIARA PERSADA 3	PAS	20.64328	20.09187	9.841317	9.798408	19.023	18.973	23.40349	23.36183	145.13595	170.74818	0	29.51	29.508125						
	10	ANTHOS	BC	9.830135	9.567555	5.396851	5.37332	10.432	10.405	12.83417	12.81133	76.649742	90.176167		16.18	16.181875						
	11	WAN HAI 212	CON	2.949041	2.870267	3.174618	3.160777	6.136	6.120	7.549513	7.536075	39.496985	46.467041		9.52	9.51875						
	12	HARRY 06	TUG	4.915068	4.783778	5.396851	5.37332	10.432	10.405	12.83417	12.81133	66.950897	78.765761		16.18	16.181875						
	13	SINAR SUMBA	CON	21.6263	21.04862	9.523855	9.48233	18.409	18.361	22.64854	22.60823	143.70795	169.06818	0	28.56	28.55625						
	14	OCEAN HIRYU	BC	8.847122	8.6108	6.666699	6.637631	12.886	12.853	15.85398	15.82576	88.181044	103.7424		19.99	19.989375						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1195.8713	1406.9075			257.95813	1415.1357	1664.8656	2280	615.13442	26.97958	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Saturday, 28 October 2017	1	TANTO SEMANGAT	CON	22.60931	22.00538	10.15878	10.11449	19.636	19.585	24.15844	24.11544	152.38326	179.27442	8.350625	30.46	38.810625						
	2	MUTIARA PERSADA 3	PAS	19.66027	19.13511	8.57147	8.534097	16.568	16.525	20.38368	20.3474	129.72511	152.61778	0	25.70	25.700625						
	3	SUNGAI MAS	CON	26.54136	25.8324	12.38101	12.32703	23.932	23.869	29.4431	29.39069	183.71671	216.1373	0	37.12	37.123125						
	4	MERATUS BENOA	GC	17.69424	17.2216	7.936546	7.901942	15.341	15.301	18.87378	18.84019	119.11004	140.12945	0	23.80	23.796875						
	5	MERATUS BANJAR I	CON	4.915068	4.783778	6.031775	6.005476	11.659	11.629	14.34407	14.31854	73.686432	86.68992		18.09	18.085625						
	6	AYER MAS	GC	6.881095	6.697289	4.761928	4.741165	9.205	9.180	11.32427	11.30411	64.094899	75.405764		14.28	14.278125						
	7	MSC GIANNA	CON	7.864108	7.654044	5.714313	5.689398	12.831	12.801	16.02433	15.99833	84.576884	99.502217		17.13	17.13375						
	8	RORO SAWITRI	GC	7.864108	7.654044	5.079389	5.057243	9.818	9.793	12.07922	12.05772	69.402436	81.649925	0	15.23	15.23						
	9	SINAR SUMBA	CON	24.57534	23.91889	11.11116	11.06272	21.477	21.421	26.42329	26.37626	166.3661	195.72482	0	33.32	33.315625						
	10	KURAU	OT	19.66027	19.13511	8.57147	8.534097	16.568	16.525	20.38368	20.3474	129.72511	152.61778	0	25.70	25.700625						
	11	TANTO LUAS	CON	9.830135	9.567555	5.714313	5.689398	11.045	11.017	13.58912	13.56494	80.01751	94.138246		17.13	17.13375						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1252.8045	1473.8876			266.30875	1479.1669	1740.1964	2220	479.80364	21.612776	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Monday, 29 October 2017	1	HIJAU TERANG	GC	0	0	2.222233	2.212544	4.295	4.284	5.284659	5.275253	23.574374	27.734558		6.66	6.663125						
	2	NAVIGATOR GLOBAL	LPG	19.66027	19.13511	10.15878	10.11449	19.636	19.585	24.15844	24.11544	146.56395	172.42817	0	30.46	30.46						
	3	PULAU WETAR	GC	43.25259	42.09724	16.50802	16.43604	31.909	31.826	39.25747	39.18759	260.47376	306.43972	0	49.50	49.4975						
	4	FATIMA III	GC	22.60931	22.00538	10.15878	10.11449	19.636	19.585	24.15844	24.11544	152.38326	179.27442	0	30.46	30.46						
	5	MERATUS BATAM	CON	20.64328	20.09187	9.206393	9.166252	17.795	17.749	21.89359	21.85462	138.40041	162.82402	0	27.60	27.604375						
	6	MAIDEN ENERGY	OT	2.949041	2.870267	3.174618	3.160777	6.731	6.715	8.360957	8.346917	42.308947	49.775232		9.52	9.51875						
	7	GH ZONDA	CON	5.898081	5.740533	4.761928	4.741165	14.763	14.735	18.90415	18.87837	88.4223	104.02624		14.28	14.278125						
	8	HONGKONG BRIDGE	CON	2.949041	2.870267	3.174618	3.160777	11.653	11.632	15.07164	15.05262	65.56402	77.134141		9.52	9.51875						
	9	TANTO SEMANGAT	CON	0.983014	0.956756	2.539695	2.528621	4.909	4.896	6.03961	6.02886	28.881911	33.978719		7.62	7.615						
	10	URU BHUM	CON	2.949041	2.870267	3.49208	3.476854	10.739	10.719	13.74433	13.7255	61.715936	72.606984		10.47	10.470625						
	11	SPEETRUM W	OT	21.6263	21.04862	9.841317	9.798408	19.023	18.973	23.40349	23.36183	147.07572	173.03026	0	29.51	29.508125						
	12	ARMADA SEJATI	CON	5.898081	5.740533	4.761928	4.741165	9.205	9.180	11.32427	11.30411	62.15513	73.123683		14.28	14.278125						
	13	LAGUN MAS	GC	5.898081	5.740533	4.761928	4.741165	9.205	9.180	11.32427	11.30411	62.15513	73.123683		14.28	14.278125						
	14	ASIA PESONA	GC	8.847122	8.6108	4.761928	4.741165	9.205	9.180	11.32427	11.30411	67.974437	79.969926		14.28	14.278125						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1347.6493	1585.4697			268.42875	1575.8137	1853.8985	2200	346.10151	15.731887	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Sunday, 30 October 2017	1	SURYA INDAH JAYA	TUG	5.898081	5.740533	5.079389	5.057243	9.818	9.793	12.07922	12.05772	65.522898	77.085762		15.23	15.23						
	2	OCEAN HIRYU	BC	6.881095	6.697289	4.444466	4.425087	11.075	11.051	13.9568	13.93547	72.46604	85.254165		13.33	13.32625						
	3	MERATUS GORONTALO	CON	8.847122	8.6108	5.714313	5.689398	12.078	12.048	14.99667	14.97143	82.955417	97.594608		17.13	17.13375						
	4	TELUK BERAU	CON	5.898081	5.740533	3.809542	3.792932	7.364	7.344	9.059415	9.04329	52.051827	61.237444	0	11.42	11.4225						
	5	Tb. CLUMENT I	TUG	11.79616	11.48107	5.714313	5.689398	11.045	11.017	13.58912	13.56494	83.897048	98.702409		17.13	17.13375						
	6	SURABAYA - GRESIK		0	0							0	0		0.00	0						
	7	PANGEMPANG	GC	29.49041	28.70267	12.38101	12.32703	23.932	23.869	29.4431	29.39069	189.53601	222.98354		37.12	37.123125						
	8	TIGER ZHEJIANG	BC	4.915068	4.783778	3.809542	3.792932	10.962	10.941	13.96689	13.94712	67.118334	78.962746		11.42	11.4225						
	9	Tb. SEMAR SATU	TUG	5.898081	5.740533	5.396851	5.37332	10.432	10.405	12.83417	12.81133	68.890666	81.047842		16.18	16.181875						
	10	GRESIK - SURABAYA		0	0							0	0		0.00	0						
	11	SINAR PAPUA	GC	15.72822	15.30809	7.619084	7.585864	14.727	14.689	18.11883	18.08658	111.86273	131.60321		22.85	22.845						
	12	ARMADA SEJATI	CON	0.983014	0.956756	2.539695	2.528621	4.909	4.896	6.03961	6.02886	28.881911	33.978719		7.62	7.615						
	13	SEGARA MAS	CON	19.66027	19.13511	9.841317	9.798408	39.332	39.267	51.09748	51.03526	239.16637	281.3722	0	29.51	29.508125						
	14	URU BHUM	CON	5.898081	5.740533	4.761928	4.741165	22.092	22.059	28.89843	28.86522	123.05625	144.77205		14.28	14.278125						
	15	TIGA RODA	BC	35.38849	34.4432	13.65086	13.59134	23.086	23.019	27.96182	27.90738	199.04773	234.17381	0	40.93	40.930625						
	16	AS CONSTANTINA	CON	10.81315	10.52431	6.349237	6.321553	26.542	26.499	34.55714	34.51581	156.12257	183.67361		19.04	19.0375						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1540.5758	1812.4421			273.18813	1772.7857	2085.6302	2220	134.36975	6.0526916	

				FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	TYPE	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
				SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Tuesday, 31 October 2017	1	DARWIN	BC	5.898081	5.740533	5.714313	5.689398	34.147	34.101	45.09137	45.04379	181.42567	213.44197	0	17.13	17.13375						
	2	MITRA KENDARI	CON	17.69424	17.2216	7.936546	7.901942	17.266	17.225	21.49909	21.46355	128.20773	150.83262	0	23.80	23.796875						
	3	DIA CHENG	GC	6.881095	6.697289	3.809542	3.792932	7.364	7.344	9.059415	9.04329	53.991596	63.519525	0	11.42	11.4225						
	4	AS SAVONIA	CON	6.881095	6.697289	5.079389	5.057243	22.544	22.509	29.43285	29.39846	127.59959	150.11717	0	15.23	15.23						
	5	INTAN DAYA 12	GC	4.915068	4.783778	4.444466	4.425087	10.832	10.808	13.62511	13.60403	67.43709	79.337753	0	13.33	13.32625						
	6	TANTO SUBUR II	CON	6.881095	6.697289	4.761928	4.741165	9.205	9.180	11.32427	11.30411	64.094899	75.405764	0	14.28	14.278125						
	7	SURYA PEKIK	GC	13.76219	13.39458	7.301622	7.269786	24.346	24.302	31.31769	31.27642	152.97068	179.96551	13.361	21.89	35.254125						
	8	MERATUS KARIANGAU	CON	5.898081	5.740533	4.127004	4.10901	7.977	7.956	9.814366	9.796898	55.419595	65.199523	16.70125	12.37	29.075625						
	9	TR ATHOS	CON	28.50739	27.74591	12.06355	12.01095	23.318	23.257	28.68815	28.63709	184.22848	216.73938	0	36.17	36.17125						
	10	MENTAYA RIVER	GC	20.64328	20.09187	10.47624	10.43056	62.603	62.519	82.66752	82.58027	352.01142	414.13109	0	31.41	31.411875						
	11	AS CONSTANTINA	CON	4.915068	4.783778	3.809542	3.792932	16.908	16.882	22.07464	22.04885	95.214751	112.01735	0	11.42	11.4225						
	12	AS SAVONIA	CON	4.915068	4.783778	4.444466	4.425087	18.614	18.585	24.2378	24.20884	104.21407	122.60479	0	13.33	13.32625						
																	TOTAL (kg)	TOTAL (L)	LOH	Margin	%	
TOTAL												1566.8156	1843.3124			251.84913	1780.8873	2095.1616	1960	-135.16157	-6.8959983	

ATTACHMENT 1
BOLLARD PULL REQUIRED

KT. KRESNA 315

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Sunday, 01 October 2017	1	TANTO FAJAR 1	GC	97.80	90.50	17.30	6.0	299.19	1.03	0.03	0.5294	16.74	0.40	1.62	0.7	0.9829	19.37	RU	9.69
	2	TANTO SEMANGAT	CON	140.00	132.93	20.50	7.8	432.32	1.03	0.04	0.5294	31.97	0.40	2.38	0.575	1.8269	36.22	TBN	18.11
	3	MERATUS MALINO	CON	149.60	140.76	23.10	6.8	507.09	1.03	0.04	0.5294	29.51	0.40	2.52	0.575	1.9004	33.98	TBN	16.99
	4	AWLI	CON	131.33	120.52	22.97	7.7	466.50	1.03	0.04	0.5294	28.61	0.40	2.16	0.575	1.8321	32.65	TBN	16.32
	5	MENTAYA RIVER	CON	101.30	92.60	17.00	6.4	299.35	1.03	0.03	0.5294	18.27	0.40	1.66	0.575	0.8659	20.82	DINI	10.41
	6	RED ROCK	GC	99.95	95.88	16.20	5.5	283.30	1.03	0.02	0.5294	16.26	0.40	1.72	0.7	0.8939	18.90	DINI	9.45
	7	SINAR BELAWAN	CON	145.68	137.21	25.00	6.5	539.99	1.03	0.05	0.5294	27.50	0.40	2.46	0.575	1.9164	31.92	B.333	15.96
	8	KOTA JUTA	CON	193.03	181.54	28.00	8.2	724.00	1.03	0.06	0.5294	45.90	0.40	3.25	0.575	3.5826	52.80	TBN	26.40
	9	SPIL NIKEN	CON	208.00	197.29	29.00	7.5	788.90	1.03	0.07	0.5294	45.62	0.40	3.54	0.575	3.6881	52.91	OVI	26.46
	10	SPIL NITA	CON	207.20	196.51	29.80	7.5	808.52	1.03	0.07	0.5294	45.45	0.40	3.52	0.575	3.775	52.81	K.306	26.41
	11	PAN DAISY	BC	179.00	172.43	28.00	9.8	630.7	1.03	0.05	0.5294	52.11	0.40	3.09	0.75	5.3044	60.55	K.306	30.28
	12	SEASPAN FRASER	CON	265.04	252.00	32.25	8.6	1042.72	1.03	0.09	0.5294	66.83	0.40	4.52	0.575	6.0073	77.44	TBN	38.72
	13	UNI FORTUNA	CON	238.00	226.35	32.00	7.6	956.83	1.03	0.08	0.5294	53.04	0.40	4.06	0.575	4.7315	61.91	TBN	30.96
TOTAL																			
										BOLLARD PULL REQUIRED									
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Monday, 02 October 2017	1	KANG MAY	BC	228.41	217.05	36.50	8.20	839.3	1.03	0.07	0.623	75.99	0.4	3.89	0.75	7.2831	87.23	B.333	43.62
	2	GUENTHER SCHUTLE	GC	230.91	219.48	32.29	10.30	944.92	1.03	0.08	0.623	96.51	0.4	3.93	0.7	7.6379	108.17	B.333	54.08
	3	STRAIT MAS	CON	163.66	154.48	26.00	5.60	603.62	1.03	0.05	0.623	36.94	0.4	2.77	0.575	1.9333	41.69	B.333	20.84
	4	PULAU HOKI	CON	120.97	114.00	20.80	6.15	403.05	1.03	0.03	0.623	29.93	0.4	2.04	0.575	1.2534	33.26	A14	16.63
	5	PALU SIPAT	OT	160.00	154.00	26.80	6.1	526.65	1.03	0.04	0.623	40.11	0.4	2.76	0.8	3.0106	45.92	TBN	22.96
	6	MERATUS GORONTALO	CON	161.85	151.13	25.60	6.9	590.17	1.03	0.05	0.623	44.52	0.4	2.71	0.575	2.2945	49.57	B.333	24.79
	7	DUTA KAPUAS 17	TUG	26.00	24.67	8.00	2.60	44.47	1.03	0.00	0.623	2.74	0.4	0.44	0.5	0.0384	3.22	-	3.22
	8	MITRA SEJAHTERA IX	CON	86.00	80.00	12.50	6.0	202.91	1.03	0.02	0.623	20.49	0.4	1.43	0.575	0.5157	22.46	DINI	11.23
	9	MERATUS GORONTALO	CON	161.85	151.13	25.60	6.9	590.17	1.03	0.05	0.623	44.52	0.4	2.71	0.575	2.2945	49.57	KTJH	24.79
	10	TIGA RODA	GC	129.50	122.50	20.60	4.8	414.98	1.03	0.04	0.623	25.10	0.4	2.20	0.7	1.2674	28.60	KTJH	14.30
	11	INTAN DAYA 4	GC	89.80	82.90	16.0	5.8	265.20	1.03	0.02	0.623	20.53	0.4	1.49	0.7	0.805	22.84	-	22.84
	12																		
	13																		
	14																		
	15																		
TOTAL																			

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	Fmoor	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Tuesday, 03 October 2017	1	OLYMPIA	CON	171.00	161.55	27.46	9.1	655.64	1.03		0.6966	78.48	0.4	2.90	0.575	3.4698	84.85	B333	42.42
	2	KOTA NABIL	CON	179.65	169.90	27.65	9.1	681.69	1.03		0.6966	82.53	0.4	3.04	0.575	3.6742	89.25	OVI	44.63
	3	TANTO LUAS	CON	119.90	115.00	21.80	4.6	420.33	1.03		0.6966	28.24	0.4	2.06	0.575	0.9912	31.29	DINI	15.65
	4	CJN 2	GC	98.00	91.56	16.00	5.6	276.99	1.03		0.6966	27.37	0.4	1.64	0.7	0.8584	29.87		29.87
	5	FREIGH EXPRESS 1	TUG	79.01	73.50	21.34	4.9	355.81	1.03		0.6966	19.15	0.4	1.32	0.5	0.572	21.04		21.04
	6	MENTARI PRATAMA	CON	98.00	92.80	15.80	5.87	273.53	1.03		0.6966	29.08	0.4	1.66	0.575	0.7398	31.48	DINI	15.74
	7	STAR OF LUCK	CON	168.00	158.66	27.20	8.5	642.10	1.03		0.6966	72.00	0.4	2.84	0.575	3.1529	77.99	OVI	39.00
	8	MERATUS PALEMBANG	GC	117.00	109.70	19.74	5.6	375.47	1.03		0.6966	32.79	0.4	1.97	0.7	1.2688	36.03	DINI	18.01
	9	SINAR AMBON	CON	92.00	85.84	20.00	4.8	335.45	1.03		0.6966	22.00	0.4	1.54	0.575	0.7083	24.24	DINI	12.12
	10	ISA EXPRESS	BC	185.74	175.77	30.43	11.0	681.9	1.03		0.6966	103.22	0.4	3.15	0.75	6.5961	112.96	B333	56.48
	11	PAC SCHEDAR	GC	179.82	170.06	27.20	10.4	671.01	1.03		0.6966	94.42	0.4	3.05	0.7	5.0336	102.50	B333	51.25
	12	MERATUS BONTANG	CON	106.68	99.84	20.60	4.2	372.71	1.03		0.6966	22.38	0.4	1.79	0.575	0.7424	24.92	B333	12.46
	13	SENDANG MAS	CON	215.10	204.16	29.92	9.5	833.03	1.03		0.6966	103.54	0.4	3.66	0.575	4.9877	112.18	B333	56.09
	14																		
	15																		
	16																		
	17																		
TOTAL																			
			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	Fmoor	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Wednesday, 04 October 2017	1	URU BHUM	CON	194.93	184.65	32.30	9.0	840.71	1.03	0.07	0.7695	147.61	0.6	7.45	0.575	4.6136	159.74	K306	79.87
	2	MERATUS BANJAR 1	CON	129.93	122.08	20.00	4.4	403.67	1.03	0.03	0.7695	47.71	0.6	4.92	0.575	0.9233	53.59	KDJ	26.80
	3	PULAU HOKI	CON	120.97	114.00	20.80	6.15	403.05	1.03	0.03	0.7695	62.27	0.6	4.60	0.575	1.2534	68.16	DINI	34.08
	4	TANTO TERANG	CON	144.83	134.25	22.40	7.1	482.12	1.03	0.04	0.7695	84.67	0.6	5.41	0.575	1.8351	91.95	VTORI	45.98
	5	PALUNG MAS	CON	107.80	100.91	18.00	3.9	327.5	1.03	0.03	0.7695	34.96	0.6	4.07	0.575	0.6088	39.66	VTORI	19.83
	6	ARMADA PERMATA	CON	129.10	121.28	24.20	6.2	486.6	1.03	0.04	0.7695	66.79	0.6	4.89	0.575	1.5641	73.29	VTORI	36.64
	7	ARMADA SERASI	CON	120.60	113.14	27.00	4.1	522.3	1.03	0.04	0.7695	41.20	0.6	4.56	0.575	1.0765	46.89	VTORI	23.44
	8	DUTA KAPUAS	TUG	26.00	24.67	8.00	2.60	44.47	1.03	0.00	0.7695	5.70	0.6	0.99	0.5	0.0384	6.73		6.73
	9	SPRING MAS	CON	183.21	173.33	27.60	7.2	689.3	1.03	0.06	0.7695	110.85	0.6	6.99	0.575	2.9605	120.86	VTORI	60.43
	10	MERATUS KARIANGAU	CON	120.00	112.57	22.00	4.2	424.4	1.03	0.04	0.7695	41.99	0.6	4.54	0.575	0.894	47.46	VTORI	23.73
	11	EVER ALLY	CON	165.00	155.77	27.10	7.0	632.4	1.03	0.05	0.7695	96.86	0.6	6.28	0.575	2.5399	105.73	TBN	52.87
	12	NAVIGATOR ARIES	LPG	159.97	150.93	25.63	7.8	2374.86	1.03	0.20	0.7695	104.57	0.6	6.09	0.8	3.6082	114.47	TBN	57.23
	13	DRAGON LUCKY	OT	111.91	104.83	19.00	8.0	276.98	1.03	0.02	0.7695	74.49	0.6	4.23	0.8	1.9055	80.65	TBN	40.32
	14	URU BHUM	CON	194.93	184.65	32.30	10.5	840.7	1.03	0.07	0.7695	172.21	0.6	7.45	0.575	5.3825	185.11	TBN	92.56
	15	SPRING MAS	CON	183.21	173.33	27.60	7.2	689.3	1.03	0.06	0.7695	110.85	0.6	6.99	0.575	2.9605	120.86	TBN	60.43
TOTAL																			

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	Fmoor	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Thursday, 05 October 2017	1	GRIYA AMBON	OT	158.00	149.04	27.00	6.8	515.17	1.03	0.04	0.8124	73.57	0.5	4.17	0.8	3.2721	81.06	B333	40.53
	2	LEO PERDANA	CON	199.93	189.48	32.00	8.6	847.3	1.03	0.07	0.8124	118.30	0.5	5.31	0.575	4.4819	128.16	OV	64.08
	3	PALUNG MAS	CON	107.80	100.91	18.00	4.8	327.5	1.03	0.03	0.8124	35.16	0.5	2.83	0.575	0.7493	38.77	KDJ	19.38
	4	MERATUS BORNEO	CON	106.68	99.10	20.60	3.8	372.7	1.03	0.03	0.8124	27.34	0.5	2.77	0.575	0.6668	30.81	RA 2	15.41
	5	GAMALISE	CON	107.00	100.14	22.00	4.0	398.7	1.03	0.03	0.8124	29.08	0.5	2.80	0.575	0.7574	32.68		32.68
	6	FREIGH EXPRESS	TUG	79.01	73.50	21.34	4.9	355.81	1.03	0.03	0.8124	26.04	0.5	2.06	0.5	0.572	28.70		28.70
	7	TANTO HARMONI	CON	97.08	89.95	17.20	5.5	296.3	1.03	0.03	0.8124	35.92	0.5	2.52	0.575	0.7314	39.19		39.19
	8	KANG MAY	BC	228.41	217.05	36.50	7.00	839.3	1.03	0.07	0.8124	110.30	0.5	6.08	0.75	6.2172	122.67	VTORI	61.33
	9	MENTAYA RIVER	CON	101.30	92.60	17.00	6.0	299.4	1.03	0.03	0.8124	40.34	0.5	2.59	0.575	0.8118	43.77	A14	21.88
	10	CSCL KINGSTON	CON	199.93	189.48	32.20	8.5	852.6	1.03	0.07	0.8124	116.93	0.5	5.31	0.575	4.4575	126.76	VTORI	63.38
	11	MERATUS TANGGUH 1	CON	115.02	107.80	18.20	7.9	342.9	1.03	0.03	0.8124	61.83	0.5	3.02	0.575	1.3322	66.21	A14	33.10
	12	EVER ALLY	CON	165.00	155.77	27.10	7.0	632.4	1.03	0.05	0.8124	79.16	0.5	4.36	0.575	2.5399	86.12	TBN	43.06
	13	SURYA PEKIK	GC	97.80	91.37	17.34	5.6	299.9	1.03	0.03	0.8124	37.14	0.5	2.56	0.7	0.9283	40.66		40.66
	14	YOU SHEN 3	OT	103.09	96.41	16.00	7.6	238.05	1.03	0.02	0.8124	53.19	0.5	2.70	0.8	1.4019	57.32		57.32
	15	TANTO TENANG	CON	136.50	126.00	22.50	7.0	467.4	1.03	0.04	0.8124	64.03	0.5	3.53	0.575	1.7057	69.30	TBN	34.65
	16	ARMADA SERASI	CON	120.60	113.14	27.00	4.1	522.3	1.03	0.04	0.8124	33.68	0.5	3.17	0.575	1.0765	37.97	KDJ	18.98
	17																		
TOTAL																			
			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	Fmoor	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Friday, 06 October 2017	1	TELUK BERAU	CON	114.30	107.60	16.00	4.7	300.45	1.03	0.03	0.836	38.88	0.5	3.01	0.575	0.6955	42.61	A14	21.31
	2	ORIENTAL EMERALD	CON	159.53	150.59	25.00	5.8	571.12	1.03	0.05	0.836	67.14	0.5	4.22	0.575	1.8768	73.28	B333	36.64
	3	TANTO HANDAL	GC	98.35	89.95	17.40	4.6	301.78	1.03	0.03	0.836	31.81	0.5	2.52	0.7	0.7533	35.11	RU	17.55
	4	MERATUS DILI	GC	118.16	110.81	18.82	6.8	359.93	1.03	0.03	0.836	57.92	0.5	3.10	0.7	1.4838	62.54	VTORI	31.27
	5	KUWIANG	CON	132.00	124.06	20.00	6.7	407.4	1.03	0.03	0.836	63.90	0.5	3.47	0.575	1.4289	68.84	OVI	34.42
	6	SERASI 1	VC	107.14	99.98	18.30	5.1	293.1	1.03	0.02	0.836	39.20	0.5	2.80	0.68	0.9485	42.97	OVI	21.49
	7	SPIL CAYA	CON	231.00	219.56	32.20	9.3	942.5	1.03	0.08	0.836	156.97	0.5	6.15	0.575	5.6513	168.85	OVI	84.43
	8	TANTO SUBUR 2	CON	113.00	103.20	19.00	5.1	354.6	1.03	0.03	0.836	40.46	0.5	2.89	0.575	0.8595	44.24	OVI	22.12
	9	CSCL COSCO SAOPAULO	CON	261.10	248.79	32.25	11.0	1031.3	1.03	0.09	0.836	210.37	0.5	6.97	0.575	7.5857	225.01	A14	112.51
	10	ORIENTAL GOLD	CON	162.00	152.89	26.00	5.5	599.7	1.03	0.05	0.836	64.64	0.5	4.28	0.575	1.8791	70.85	FTMH	35.43
	11	SPIL CITRA	CON	231.00	219.56	32.20	8.1	942.5	1.03	0.08	0.836	136.72	0.5	6.15	0.575	4.9221	147.87	B333	73.93
	12	PRATAMA 1	TUG	18.75	18.75	5.25	2.3	18.7	1.03	0.00	0.836	3.32	0.5	0.53	0.5	0.0169	3.86		3.86
	13	MAHKOTA NUSANTARA	PS	123.00	115.50	18.03	6.6	313.6	1.03	0.03	0.836	58.60	0.5	3.23	0.68	1.397	63.26	KDJ	31.63
	14	LINTAS BATANGHARI	GC	85.95	80.09	13.60	4.9	220.7	1.03	0.02	0.836	30.17	0.5	2.24	0.7	0.5584	32.99		32.99
	15	OOCL NORFOLK	CON	260.05	247.76	32.25	11.2	1028.2	1.03	0.09	0.836	213.32	0.5	6.94	0.575	7.6919	228.04	OVI	114.02
TOTAL																			

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Saturday, 07 October 2017	1	HANSA SIEGBRUG	CON	175.47	165.86	27.40	8.3	665.2	1.03	0.06	0.8338	105.29	0.5	4.64	0.575	3.2421	113.23	OVI	56.61
	2	MAHKOTA NUSANTARA	PS	123.00	115.50	18.03	6.6	313.6	1.03	0.03	0.8338	58.30	0.5	3.23	0.68	1.397	62.96	FTMH	31.48
	3	TANTO BERKAT	CON	119.32	110.20	18.00	7.1	346.1	1.03	0.03	0.8338	59.84	0.5	3.09	0.575	1.2105	64.16	KDJ	32.08
	4	BBC NEW YORK	GC	132.20	124.25	15.87	8.2	323.5	1.03	0.03	0.8338	77.92	0.5	3.48	0.7	1.6919	83.12	B333	41.56
	5	SPIL HANA	CON	135.70	133.00	22.50	3.7	465.8	1.03	0.04	0.8338	37.64	0.5	3.72	0.575	0.9517	42.35	B333	21.18
	6	MSC GIANNA	CON	201.56	191.06	32.25	9.7	858.6	1.03	0.07	0.8338	141.74	0.5	5.35	0.575	5.137	152.30	TBN	76.15
	7	CSCL COSCO SAOPAULO	CON	261.10	248.79	32.25	11.0	1031.3	1.03	0.09	0.8338	209.30	0.5	6.97	0.575	7.5857	223.94	TBN	111.97
	8	NBP PERDANA	TUG	24.00	22.60	7.00	2.8	34.2	1.03	0.00	0.8338	4.82	0.5	0.63	0.500	0.033	5.49		5.49
	9	NORTHERN VOLITION	CON	221.70	210.55	29.86	9.7	849.1	1.03	0.07	0.8338	156.20	0.5	5.90	0.575	5.2416	167.41	306	83.70
	10	TANTO SENANG	CON	140.00	132.94	20.50	4.5	432.3	1.03	0.04	0.8338	45.75	0.5	3.72	0.575	1.0541	50.57	306	25.28
	11	KOTA JAYA	CON	193.03	182.81	28.00	9.9	724.0	1.03	0.06	0.8338	138.42	0.5	5.12	0.575	4.3556	147.95	OVI	73.98
	12	SPIL NIKEN	CON	208.00	197.29	29.00	7.5	788.9	1.03	0.07	0.8338	113.16	0.5	5.52	0.575	3.6881	122.44	306	61.22
	13	MERATUS KALABAHI	CON	128.84	121.52	23.00	6.3	462.0	1.03	0.04	0.8338	58.55	0.5	3.40	0.575	1.5134	63.51	FTMH	31.75
	14	SIREMAX	CON	111.00	103.96	20.00	3.6	369.6	1.03	0.03	0.8338	28.62	0.5	2.91	0.575	0.6434	32.21		32.21
	15	PRITHA	GC	97.50	91.08	18.40	3.5	317.7	1.03	0.03	0.8338	24.38	0.5	2.55	0.7	0.6137	27.57		27.57
	16																		
	17																		
TOTAL																			
			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Sunday, 08 October 2017	1	MUTIARA BARITO	CON	134.00	125.98	19.00	4.4	390.4	1.03	0.03	0.7888	37.94	0.5	3.53	0.575	0.9052	42.41	306	21.20
	2	MEDELIN EXPO	OT	149.02	140.14	22.80	8.0	464.68	1.03	0.04	0.7888	76.74	0.5	3.92	0.8	3.0567	83.76	TBN	41.88
	3	MUTIARA FERINDO 1	PS	166.00	156.74	28	5.4	714.9	1.03	0.06	0.7888	57.93	0.5	4.39	0.68	2.4089	64.79	306	32.39
	4	SPIL HANA	CON	135.70	133.00	22.50	3.7	465.8	1.03	0.04	0.7888	33.68	0.5	3.72	0.575	0.9517	38.40	FTMH	19.20
	5	ORIENTAL EMERALD	CON	159.53	150.59	25.00	5.8	571.1	1.03	0.05	0.7888	59.78	0.5	4.22	0.575	1.8768	65.92	B333	32.96
	6	RED ROVER	CON	105.00	97.60	16.20	3.0	290.7	1.03	0.02	0.7888	20.04	0.5	2.73	0.575	0.4077	23.21	KDJ	11.60
	7	NORTHERN VOLITION	CON	221.70	210.55	29.86	9.7	849.1	1.03	0.07	0.7888	139.79	0.5	5.90	0.575	5.2416	151.00	TBN	75.50
	8	GULF MAS	CON	144.00	134.00	21.50	4.00	461.1	1.03	0.04	0.7888	36.69	0.5	3.75	0.575	0.9905	41.47	TBN	20.73
	9	KOTA JUTA	CON	193.03	181.54	28.00	8.8	724.0	1.03	0.06	0.7888	109.34	0.5	5.08	0.575	3.8447	118.33	306	59.17
	10	SINAR SABANG	CON	175.00	165.41	27.40	10.6	664.1	1.03	0.06	0.7888	120.01	0.5	4.63	0.575	4.1292	128.83	306	64.41
	11	BALLENITA	CON	208.93	198.19	29.85	9.2	814.5	1.03	0.07	0.7888	124.80	0.5	5.55	0.575	4.6779	135.09	FTMH	67.55
	12	SEASPAN SANTOS	CON	260.10	247.81	32.35	10.6	1031.6	1.03	0.09	0.7888	179.79	0.5	6.94	0.575	7.3039	194.12	OVI	97.06
	13	ANGUS EXPRESS	BC	103.10	96.42	16.80	5.8	343.4	1.03	0.03	0.7888	38.28	0.5	2.70	0.75	1.0533	42.06	OVI	21.03
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TOTAL																			

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Monday, 09 October 2017	1	MERATUS SABANG	GC	98.00	92.15	16.50	4.1	285.7	1.03	0.02	0.7009	20.42	0.5	2.58	0.7	0.6523	23.68	RST	11.84
	2	BBC AFRICA	GC	119.79	113.50	20.53	8.2	395.6	1.03	0.03	0.7009	50.30	0.5	3.18	0.7	1.9993	55.51	TBN	27.75
	3	SPIL NIKEN	CON	208.00	197.29	29.00	7.5	788.9	1.03	0.07	0.7009	79.96	0.5	5.52	0.575	3.6881	89.24	TBN	44.62
	4	CITRA KARYA PAPUA	GC	75.45	70.50	12.00	4.7	183.4	1.03	0.02	0.7009	17.91	0.5	1.97	0.7	0.4161	20.31		20.31
	5	MERATUS GORONTALO	CON	161.85	151.13	25.60	6.3	590.2	1.03	0.05	0.7009	51.46	0.5	4.23	0.575	2.095	57.83	JM	28.92
	6	MERATUS KARIMATA	CON	120.00	112.57	22.00	4.8	424.4	1.03	0.04	0.7009	29.20	0.5	3.15	0.575	1.0217	33.41	TBN	16.71
	7	SITU MAS	CON	215.32	204.37	29.92	7.9	833.6	1.03	0.07	0.7009	87.25	0.5	5.72	0.575	4.152	97.20	B333	48.60
	8	MARINA STAR 2	CON	147.50	138.52	22.20	6.4	483.1	1.03	0.04	0.7009	47.91	0.5	3.88	0.575	1.6916	53.52	B333	26.76
	9	AYER MAS	CON	94.94	86.02	16.00	3.6	272.6	1.03	0.02	0.7009	16.74	0.5	2.41	0.575	0.4259	19.59	A14	9.80
	10	TOMINI DIGNITY	BC	190.00	179.89	32.26	9.7	719.5	1.03	0.06	0.7009	94.30	0.5	5.04	0.75	6.3107	105.71	B333	52.85
	11	MUTIARA PERSADA 3	PS	151.13	138.00	23.00	6.7	514.8	1.03	0.04	0.7009	49.97	0.5	3.86	0.68	2.1616	56.04	FTMH	28.02
	12	BALLENITA	CON	208.93	198.19	29.85	9.2	814.5	1.03	0.07	0.7009	98.54	0.5	5.55	0.575	4.6779	108.83	306	54.42
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TOTAL																			
			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Tuesday, 10 October 2017	1	KABOGA BARU	GC	73.52	68.00	11.00	3.7	166.2	1.03	0.01	0.6195	10.62	0.5	1.90	0.7	0.2896	12.83		12.83
	2	MEDELIN EXPO	OT	149.02	140.14	22.80	8.0	464.68	1.03	0.04	0.6195	47.33	0.5	3.92	0.8	3.0567	54.35	OVI	27.17
	3	SPIL NINGSIH	CON	208.30	197.58	29.89	8.3	813.9	1.03	0.07	0.6195	69.22	0.5	5.53	0.575	4.213	79.04	FTMH	39.52
	4	TANTO BAGUS	GC	126.40	118.69	19.40	5.5	385.4	1.03	0.03	0.6195	27.56	0.5	3.32	0.7	1.3252	32.24	306	16.12
	5	MERATUS BANJAR 1	CON	129.93	121.56	20.00	4.4	403.7	1.03	0.03	0.6195	22.58	0.5	3.40	0.575	0.9194	26.94	306	13.47
	6	LINTAS ASAHAN	GC	85.95	79.42	13.60	3.7	220.7	1.03	0.02	0.6195	12.40	0.5	2.22	0.7	0.4182	15.06		15.06
	7	MERATUS BORNEO	CON	106.68	99.10	20.60	3.8	372.7	1.03	0.03	0.6195	15.90	0.5	2.77	0.575	0.6668	19.37	KDJ	9.68
	8	MERATUS MALINO	CON	149.60	140.76	23.10	7.5	507.1	1.03	0.04	0.6195	44.56	0.5	3.94	0.575	2.096	50.64	306	25.32
	9	AYER MAS	CON	94.94	86.02	16.00	3.6	272.6	1.03	0.02	0.6195	13.07	0.5	2.41	0.575	0.4259	15.93	B333	7.96
	10	GRIYA MELAYU	OT	98.11	89.50	15.60	5.5	217.15	1.03	0.02	0.6195	20.78	0.5	2.51	0.8	0.9183	24.22		24.22
	11	PULAU HOKI	CON	120.97	114.00	20.80	6.15	403.1	1.03	0.03	0.6195	29.60	0.5	3.19	0.575	1.2534	34.07	FTMH	17.04
	12	TIGER SUMMER	OT	117.60	110.27	19.00	6.0	303.34	1.03	0.03	0.6195	27.93	0.5	3.09	0.8	1.5033	32.55	B333	16.27
	13	LAGUN MAS	GC	96.50	90.80	15.80	6.0	271.4	1.03	0.02	0.6195	22.81	0.5	2.54	0.7	0.8932	26.26	B333	13.13
	14																		
	15																		
TOTAL																			

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	Fmoor	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Wednesday, 11 October 2017	1	NRS 5	TUG	26.50	24.76	7.50	2.7	40.1	1.03	0.00	0.5209	2.00	0.5	0.69	0.5	0.0375	2.73		2.73
	2	RELIANCE	CON	135.56	127.48	22.60	4.8	467.6	1.03	0.04	0.5209	18.26	0.5	3.57	0.575	1.1886	23.06	KDJ	11.53
	3	INTAN DAYA	CON	85.95	79.00	13.60	4.9	220.7	1.03	0.02	0.5209	11.55	0.5	2.21	0.575	0.4525	14.24		14.24
	4	TANTO HEMAT	CON	119.90	115.00	21.80	4.2	420.3	1.03	0.04	0.5209	14.41	0.5	3.22	0.575	0.905	18.58	A14	9.29
	5	WARNOW CHIEF	CON	180.36	170.58	25.26	8.1	624.4	1.03	0.05	0.5209	41.24	0.5	4.78	0.575	2.9998	49.06	B333	24.53
	6	BILITON 15	TUG	27.80	25.32	8.00	2.9	45.6	1.03	0.00	0.5209	2.19	0.5	0.71	0.5	0.0439	2.95		2.95
	7	LEGUNDI	PS	109.40	99.57	19.60	3.8	326.9	1.03	0.03	0.5209	11.29	0.5	2.79	0.68	0.7538	14.86	R2	7.43
	8	LAGUN MAS	GC	96.50	90.80	15.80	6.0	271.4	1.03	0.02	0.5209	16.12	0.5	2.54	0.7	0.8932	19.58	B333	9.79
	9	AYER MAS	CON	94.94	86.02	16.00	3.6	272.6	1.03	0.02	0.5209	9.24	0.5	2.41	0.575	0.4259	12.10	B333	6.05
	10	ISA GLORY	BC	160.00	150.50	24.40	7.7	544.5	1.03	0.05	0.5209	34.58	0.5	4.21	0.75	3.17	42.02	MIII	21.01
	11	TIMUR LAUT MAS	OT	75.00	69.69	12.00	6.0	131.07	1.03	0.01	0.5209	12.48	0.5	1.95	0.8	0.6001	15.04		15.04
	12	SPIL NINGSIH	CON	208.30	197.58	29.89	8.3	813.9	1.03	0.07	0.5209	48.94	0.5	5.53	0.575	4.213	58.76	TBN	29.38
	13	MERATUS BENOA	CON	106.68	99.11	20.60	4.0	372.7	1.03	0.03	0.5209	11.83	0.5	2.78	0.575	0.7019	15.34	RST.0	7.67
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TOTAL																			
			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	Fmoor	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Thursday, 12 October 2017	1	PULAU HOKI	CON	120.97	114.00	20.80	6.15	403.1	1.03	0.03	0.4759	17.46	0.5	3.19	0.575	1.2534	21.94	306	10.97
	2	AYER MAS	CON	94.94	86.02	16.00	4.5	272.6	1.03	0.02	0.4759	9.64	0.5	2.41	0.575	0.5323	12.61	B333	6.30
	3	SAWU SEA	GC	129.50	121.31	19.00	6.6	382.7	1.03	0.03	0.4759	19.94	0.5	3.40	0.7	1.5917	24.96	TBN	12.48
	4	MARINA STAR 2	CON	147.50	138.52	22.20	7.4	483.1	1.03	0.04	0.4759	25.53	0.5	3.88	0.575	1.9559	31.41	TBN	15.70
	5	LUMOSO SELAMAT	CON	106.41	99.10	20.00	4.9	361.4	1.03	0.03	0.4759	12.10	0.5	2.77	0.575	0.8347	15.74	RST	7.87
	6	PRAKA VENTURE	CON	111.00	103.96	19.10	3.4	353.0	1.03	0.03	0.4759	8.80	0.5	2.91	0.575	0.5803	12.33		12.33
	7	ARMADA SETIA	CON	114.00	105.08	18.22	5.3	341.6	1.03	0.03	0.4759	13.87	0.5	2.94	0.575	0.8722	17.72	TBN	8.86
	8	CHILOE ISLAND	CON	222.14	210.98	30.07	11.7	856.2	1.03	0.07	0.4759	61.49	0.5	5.91	0.575	6.3797	73.85	306	36.92
	9	Tb. DRAKO VALIANT	TUG	23.50	22.08	7.00	2.5	37.0	1.03	0.00	0.4759	1.37	0.5	0.62	0.5	0.0289	2.03		2.03
	10	TELUK FLAMINGGO	CON	114.30	107.60	16.00	5.3	300.4	1.03	0.03	0.4759	14.20	0.5	3.01	0.575	0.7843	18.03	FTMH	9.01
	11	OCEAN SUKSES	BC	199.99	193.57	32.25	8.0	730.8	1.03	0.06	0.4759	38.57	0.5	5.42	0.75	5.5989	49.65	OVI	24.83
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			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	Fmoor	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Friday, 13 October 2017	1	ASIA PESONA	GC	75.00	70.00	12.50	7.0	190.6	1.03	0.02	0.5166	14.38	0.5	1.96	0.7	0.6409	17.00		17.00
	2	KIRAN ASYA	BC	238.15	226.50	32.24	8.2	774.1	1.03	0.07	0.5166	54.52	0.5	6.34	0.75	6.713	67.64	306	33.82
	3	MENTARI EXPRESS	CON	94.80	87.52	15.20	6.5	258.8	1.03	0.02	0.5166	16.70	0.5	2.45	0.575	0.7432	19.92		19.92
	4	SINAR SUMBA	CON	175.00	165.41	27.40	9.4	664.1	1.03	0.06	0.5166	45.64	0.5	4.63	0.575	3.6618	53.99	B333	27.00
	5	FATIMA 3	CON	101.10	94.51	19.00	4.8	334.2	1.03	0.03	0.5166	13.32	0.5	2.65	0.575	0.7408	16.73	B333	8.37
	6	TANTO SEMANGAT	CON	140.00	132.93	20.50	6.4	432.3	1.03	0.04	0.5166	24.97	0.5	3.72	0.575	1.499	30.23	306	15.12
	7	ORIENTAL MUTIARA	CON	176.59	167.67	27.50	5.6	670.4	1.03	0.06	0.5166	27.56	0.5	4.69	0.575	2.2193	34.53	306	17.27
	8	BILITON 15	TUG	27.80	25.32	8.00	2.9	45.6	1.03	0.00	0.5166	2.16	0.5	0.71	0.5	0.0439	2.91		2.91
	9	SEGARA MAS	CON	215.29	205.28	29.95	7.5	834.4	1.03	0.07	0.5166	45.19	0.5	5.75	0.575	3.9633	54.98	306	27.49
	10	LEGUNDI	PS	109.40	99.57	19.60	3.8	326.9	1.03	0.03	0.5166	11.11	0.5	2.79	0.68	0.7538	14.68	OV	7.34
	11	HAPPY STAR	CON	123.00	115.44	20.00	3.8	391.2	1.03	0.03	0.5166	12.88	0.5	3.23	0.575	0.7541	16.90	A14	8.45
	12	ANSAC COLOMBIA	BC	179.97	173.52	29.80	7.3	664.0	1.03	0.06	0.5166	37.18	0.5	4.86	0.75	4.2319	46.33	OV	23.17
	13	LOGISTIC NUSANTARA	GC	126.08	113.75	20.00	5.7	396.7	1.03	0.03	0.5166	19.03	0.5	3.19	0.7	1.3569	23.61	TBN	11.80
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			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	Fmoor	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Saturday, 14 October 2017	1	KOTA JUTA	CON	193.03	181.54	28.00	9.0	724.0	1.03	0.06	0.613	67.55	0.5	5.08	0.575	3.9321	76.62	OV	38.31
	2	TANTO HEMAT	CON	119.90	115.00	21.80	4.2	420.3	1.03	0.04	0.613	19.97	0.5	3.22	0.575	0.905	24.13	FTMH	12.06
	3	LINTAS BARITO	GC	85.32	78.80	13.60	4.7	219.9	1.03	0.02	0.613	15.41	0.5	2.21	0.7	0.5304	18.16		18.16
	4	MERATUS PEKAN BARU	GC	117.00	110.00	19.74	4.6	375.5	1.03	0.03	0.613	20.92	0.5	3.08	0.7	1.0451	25.08		25.08
	5	PRATAMA 3	TUG	28.50	26.03	8.60	3.3	54.4	1.03	0.00	0.613	3.55	0.5	0.73	0.5	0.0552	4.34		4.34
	6	MUTIARA PERSADA	PS	151.13	138.00	23.00	6.7	514.8	1.03	0.04	0.613	38.22	0.5	3.86	0.68	2.1616	44.29	306	22.15
	7	SINAR AMBON	CON	92.00	85.84	20.00	5.4	335.5	1.03	0.03	0.613	19.16	0.5	2.40	0.575	0.7968	22.39		22.39
	8	TELUK BERAU	CON	114.30	107.60	16.00	4.4	300.4	1.03	0.03	0.613	19.57	0.5	3.01	0.575	0.6511	23.26	KDJ	11.63
	9	NAJADE	CON	215.29	205.93	29.95	8.5	834.4	1.03	0.07	0.613	72.36	0.5	5.77	0.575	4.5059	82.71	306	41.35
	10	MSC IMMA	CON	201.47	190.00	32.25	8.9	858.4	1.03	0.07	0.613	69.91	0.5	5.32	0.575	4.6873	79.99	306	39.99
	11	TANTO LESTARI	CON	124.02	115.13	20.90	7.9	410.7	1.03	0.03	0.613	37.60	0.5	3.22	0.575	1.6338	42.49	306	21.25
	12	LUNA BLUE	CON	124.55	115.49	20.50	7.3	403.8	1.03	0.03	0.613	34.853472	0.5	3.23	0.575	1.4855	39.61	B333	19.80
	13	MERATUS SABANG	GC	98.00	92.15	16.50	4.2	285.7	1.03	0.02	0.613	16.00	0.5	2.58	0.7	0.6682	19.27	RST 2	9.64
	14	NORD PLUTO	BC	228.99	225.10	32.26	8.3	764.0	1.03	0.06	0.613	77.24	0.5	6.30	0.75	6.7571	90.36	B333	45.18
	15	MERATUS KELIMUTU	CON	128.84	121.52	23.00	6.1	462.0	1.03	0.04	0.613	30.64	0.5	3.40	0.575	1.4654	35.55	RU	17.78
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Sunday, 15 October 2017	1	SPIL NIRMALA	CON	211.85	202.14	29.80	8.9	821.0	1.03	0.07	0.6945	95.45	0.4	3.62	0.575	4.6079	103.75	306 FTM	34.58
	2	KARUNIA SEJATRA	CON	95.00	88.70	15.00	3.2	255.6	1.03	0.02	0.6945	15.06	0.4	1.59	0.575	0.3659	17.04		17.04
	3	KOTA JUTA	CON	193.03	181.54	28.00	9.0	724.0	1.03	0.06	0.6945	86.69	0.4	3.25	0.575	3.9321	93.93	FTM	46.97
	4	LOGISTIC NUSANTARA	GC	126.08	113.75	20.00	5.7	396.7	1.03	0.03	0.6945	34.40	0.4	2.04	0.7	1.3569	37.83	RSTU	18.91
	5	MILA UTAMA	PS	134.86	126.17	20.00	6.1	388.7	1.03	0.03	0.6945	40.77	0.4	2.26	0.68	1.562	44.62	TBN	22.31
	6	ANUGRAH BUANA 8	GC	99.00	82.60	14.00	5.4	243.6	1.03	0.02	0.6945	23.67	0.4	1.48	0.7	0.6534	25.82		25.82
	7	PRATIWI RAYA	CON	96.85	90.80	15.80	4.7	271.9	1.03	0.02	0.6945	22.64	0.4	1.63	0.575	0.5795	24.87		24.87
	8	MAHAKAMAH 1	OT	177.00	167.34	27.70	7.2	627.41	1.03	0.05	0.6945	63.92	0.4	3.00	0.8	3.991	70.97	KDJ	35.48
	9	TANTO SUBUR 1	CON	113.00	103.20	19.00	6.6	354.6	1.03	0.03	0.6945	36.14	0.4	1.85	0.575	1.1123	39.13		39.13
	10	SERASI 1	VC	107.14	99.98	18.30	5.5	293.1	1.03	0.02	0.6945	29.18	0.4	1.79	0.68	1.0229	32.01	A14	16.01
	11	SEGARA MAS	CON	215.29	205.28	29.95	9.5	834.4	1.03	0.07	0.6945	103.47	0.4	3.68	0.575	5.0201	112.24	OVI	56.12
	12	MERATUS BATAM	CON	138.87	129.61	23.90	6.7	501.6	1.03	0.04	0.6945	46.07	0.4	2.32	0.575	1.7839	50.22	OVI	25.11
	13	AAMMONIA BOROLINA							1.03	0.00	0.6945	-	0.4	-	0.575	0	-	306	-
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DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Monday, 16 October 2017	1	ANSAC COLOMBIA	BC	179.97	173.52	29.80	7.3	664.0	1.03	0.06	0.7652	81.59	0.4	3.11	0.75	4.2319	88.99	306	44.50
	2	TANTO BERSINAR	CON	161.85	152.74	25.60	6.7	590.2	1.03	0.05	0.7652	65.92	0.4	2.74	0.575	2.2517	70.96	306	35.48
	3	LUMOSO GEMBIRA	CON	106.41	99.10	20.60	4.2	372.2	1.03	0.03	0.7652	26.68	0.4	1.78	0.575	0.7334	29.22	KDJ	14.61
	4	RSP 2	CON	128.00	120.23	23.00	4.5	460.2	1.03	0.04	0.7652	34.85	0.4	2.15	0.575	1.0695	38.11		38.11
	5	NOAH 7	TUG	26	23.65	7.80	2.6	45.3	1.03	0.00	0.7652	3.96	0.4	0.42	0.5	0.0358	4.42		4.42
	6	NORTHERN VIVACITY	CON	221.74	209.62	29.86	10.3	849.2	1.03	0.07	0.7652	139.08	0.4	3.76	0.575	5.5413	148.45	OVI	74.22
	7	TANTO RAYA	CON	120.84	111.66	20.20	6.0	391.2	1.03	0.03	0.7652	43.16	0.4	2.00	0.575	1.1632	46.35	KTJ	23.18
	8	ORIENTAL EMERALD	CON	159.53	150.59	25.00	5.8	571.1	1.03	0.05	0.7652	56.26	0.4	2.70	0.575	1.8768	60.88	B333	30.44
	9	TAICHUNG	CON	183.21	172.90	27.60	7.8	689.3	1.03	0.06	0.7652	86.87	0.4	3.10	0.575	3.1992	93.23	306	46.61
	10	CSCL SANTIAGO	CON	208.90	198.16	29.84	11.6	814.2	1.03	0.07	0.7652	148.06	0.4	3.55	0.575	5.8954	157.58	B333	78.79
	11	KOTA NASRAT	CON	179.63	169.88	27.64	10.5	681.4	1.03	0.06	0.7652	114.90	0.4	3.04	0.575	4.2375	122.24	B333	61.12
	12	MENTARI SUCCESS	GC	85.80	81.12	15.00	5.3	243.2	1.03	0.02	0.7652	27.69	0.4	1.45	0.7	0.6748	29.84	A14	14.92
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TOTAL																			

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Tuesday, 17 October 2017	1	NORTHERN VIVACITY	CON	221.74	209.62	29.86	10.0	849.2	1.03	0.07	0.8295	161.91	0.4	3.83	0.575	5.3799	171.20	B333	85.60
	2	KISIK MAS	CON	144.00	134.00	21.50	4.1	461.1	1.03	0.04	0.8295	42.44	0.4	2.45	0.575	1.0153	45.94	MIII	22.97
	3	PEK 246	TUG	29.40	26.81	8.70	2.7	55.8	1.03	0.00	0.8295	5.59	0.4	0.49	0.5	0.0471	6.13		6.13
	4	MT. KATO MAS	OT	105.00	99.00	18.80	4.7	246.28	1.03	0.02	0.8295	35.94	0.4	1.81	0.8	1.0461	38.82	FTMH	19.41
	5	PEKAN FAJAR	CON	113.80	110.10	21.80	4.7	408.4	1.03	0.04	0.8295	39.54	0.4	2.01	0.575	0.9593	42.55	306	21.28
	6	NAVIGATOR ARIES	LT	159.97	150.93	25.63	7.1	621.6	1.03	0.05	0.8295	82.77	0.4	2.76	0.68	2.7917	88.38	B333	44.19
	7	CSCL SANTIAGO	CON	208.90	198.16	29.84	10.9	814.2	1.03	0.07	0.8295	166.83	0.4	3.62	0.575	5.5397	176.06	OVI	88.03
	8	TAICHUNG	CON	183.21	172.90	27.60	7.2	689.3	1.03	0.06	0.8295	96.15	0.4	3.16	0.575	2.9531	102.33	OVI	51.16
	9	NEW GLORY	GC	91.00	84.91	13.60	5.3	226.9	1.03	0.02	0.8295	34.76	0.4	1.55	0.7	0.6404	36.97		36.97
	10	DAHLIA	BC	48.70	46.77	15.20	5.8	252.8	1.03	0.02	0.8295	20.95	0.4	0.86	0.75	0.4623	22.29	OV	11.15
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			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Wednesday, 18 October 2017	1	NORDWOGE	CON	210.00	199.22	30.17	8.6	826.2	1.03	0.07	0.8788	145.56	0.7	10.93	0.575	4.4428	161.01	OV	80.50
	2	TANTO PERMAI	CON	144.02	135.00	21.80	7.9	467.6	1.03	0.04	0.8788	90.61	0.7	7.41	0.575	1.9983	100.06	TBN	50.03
	3	GULF MAS	CON	144.00	134.00	21.50	4.40	461.1	1.03	0.04	0.8788	50.09	0.7	7.35	0.575	1.0895	58.58	KDJ	29.29
	4	MERATUS MAKASSAR	CON	149.60	140.77	23.10	7.9	507.1	1.03	0.04	0.8788	94.48	0.7	7.73	0.575	2.208	104.46	TBN	52.23
	5	NIRBITA	OT	165.80	158.29	27.40	8.5	560.41	1.03	0.05	0.8788	114.31	0.7	8.69	0.8	4.4085	127.45	306	63.73
	6	NOAH 7	TUG	26	23.65	7.80	2.6	45.3	1.03	0.00	0.8788	5.22	0.7	1.30	0.5	0.0358	6.56		6.56
	7	SAVIOUR	GC	101.10	94.51	19.20	5.8	337.7	1.03	0.03	0.8788	46.57	0.7	5.19	0.7	1.1013	52.89	KDJ	26.44
	8	LENA	OT	96.01	89.66	19.05	7.0	208.57	1.03	0.02	0.8788	53.32	0.7	4.92	0.8	1.4298	59.69	FTMH	29.85
	9	TANTO SENTOSA	CON	105.00	96.00	20.00	6.2	358.8	1.03	0.03	0.8788	50.57	0.7	5.27	0.575	1.0232	56.89	B333	28.45
	10	SINAR AMBON	CON	92.00	85.84	20.00	5.0	335.5	1.03	0.03	0.8788	36.47	0.7	4.71	0.575	0.7378	41.94		41.94
	11	MILA UTAMA	PS	134.86	126.17	20.00	6.1	388.7	1.03	0.03	0.8788	65.28	0.7	6.92	0.68	1.562	73.80	KDJ	36.90
	12	SPIL CITRA	CON	231.00	219.56	32.20	8.7	942.5	1.03	0.08	0.8788	162.29	0.7	12.05	0.575	5.2867	179.71	TBN	89.85
	13	TELUK FLAMINGGO	CON	114.30	107.60	16.00	5.0	300.4	1.03	0.03	0.8788	45.71	0.7	5.91	0.575	0.7399	52.38	RU	26.19
	14																		
	15																		
TOTAL																			

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Thursday, 19 October 2017	1	DONGHAI STAR	BC	228.90	217.53	32.00	7.5	759.2	1.03	0.06	0.8681	135.25	0.5	6.09	0.75	5.8529	147.26	TBN	73.63
	2	TANTO HORAS	CON	97.08	89.95	17.20	6.0	296.3	1.03	0.03	0.8681	44.74	0.5	2.52	0.575	0.7979	48.08		48.08
	3	KATOMAS	OT	105.00	99.00	18.80	4.7	246.28	1.03	0.02	0.8681	38.57	0.5	2.77	0.8	1.0461	42.41	KDJ	21.21
	4	TANTO HANDAL	CON	98.35	89.95	17.40	4.7	301.8	1.03	0.03	0.8681	35.05	0.5	2.52	0.575	0.6323	38.22		38.22
	5	TANTO STAR	CON	147.5	138.00	22.20	6.5	483.1	1.03	0.04	0.8681	74.36	0.5	3.86	0.575	1.7116	79.98	306	39.99
	6	FATIMAH 3	CON	101.10	94.51	19.00	4.8	334.2	1.03	0.03	0.8681	37.61	0.5	2.65	0.575	0.7408	41.02	A14	20.51
	7	NORTHERN DEMOCRAT	CON	230.92	219.49	32.29	9.8	944.9	1.03	0.08	0.8681	178.32	0.5	6.15	0.575	5.9697	190.51	B333	95.26
	8	STAR HIDRA	GC	198.00	187.62	31.00	8.6	815.4	1.03	0.07	0.8681	133.76	0.5	5.25	0.7	5.2337	144.31	FTMH	72.16
	9	MARINA STAR 2	CON	147.50	138.52	22.20	7.4	483.1	1.03	0.04	0.8681	84.98	0.5	3.88	0.575	1.9559	90.85	TBN	45.43
	10	MUTIARA BENOA	CON	134.00	125.98	19.00	3.8	390.4	1.03	0.03	0.8681	39.69	0.5	3.53	0.575	0.7818	44.03	RSTU	22.01
	11	MUTIARA PERSADA 3	PS	151.13	138.00	23.00	6.7	514.8	1.03	0.04	0.8681	76.65	0.5	3.86	0.68	2.1616	82.72	OVI	41.36
	12	TANTO BERKAT	CON	119.32	110.20	18.00	7.1	346.1	1.03	0.03	0.8681	64.86	0.5	3.09	0.575	1.2105	69.19	VTORI	34.59
	13	MS HAWK	CON	222.20	211.03	30.00	10.8	854.4	1.03	0.07	0.8681	188.94	0.5	5.91	0.575	5.8769	200.80	306	100.40
	14	NAVIGATOR GLOBAL	LNG	154.00	145.19	25.52	7.6	492.46	1.03	0.04	0.8681	91.47	0.5	4.07	0.8	3.3674	98.95	333	49.47
	15	KAWA MAS	CON	107.80	100.91	18.00	3.6	327.5	1.03	0.03	0.8681	30.11	0.5	2.83	0.575	0.562	33.53	TBN	16.76
	16	KMTC CENNAI	CON	261.40	249.08	32.25	11.0	1032.2	1.03	0.09	0.8681	227.13	0.5	6.97	0.575	7.5946	241.79	306	120.90
TOTAL																			

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Friday, 20 October 2017	1	ARMADA SEJATI	CON	114.00	106.00	18.20	7.6	341.3	1.03	0.03	0.8467	63.53	0.5	2.97	0.575	1.2602	67.78	A14	33.89
	2	SWARNA BAHTERA	PS	93.00	85.00	16.00	5.5	221.5	1.03	0.02	0.8467	36.87	0.5	2.38	0.68	0.7603	40.02		40.02
	3	LAGUN MAS	GC	96.50	90.80	15.80	6.0	271.4	1.03	0.02	0.8467	42.60	0.5	2.54	0.7	0.8932	46.06	B333	23.03
	4	SENDANG MAS	CON	215.10	204.16	29.92	7.9	833.0	1.03	0.07	0.8467	127.18	0.5	5.72	0.575	4.1477	137.12	B333	68.56
	5	PALUNG MAS	CON	107.80	100.91	18.00	3.7	327.5	1.03	0.03	0.8467	29.44	0.5	2.83	0.575	0.5776	32.87	B333	16.44
	6	SELATAN DAMAI	CON	116.00	108.74	21.00	5.9	397.5	1.03	0.03	0.8467	50.59	0.5	3.04	0.575	1.158	54.83	B333	27.41
	7	WAN HAI 281	CON	182.80	172.93	28.04	7.3	699.2	1.03	0.06	0.8467	99.55	0.5	4.84	0.575	3.0425	107.49	B333	53.75
	8	MERATUS KAMPAR	CON	119.90	115.03	21.80	4.5	420.3	1.03	0.04	0.8467	40.82	0.5	3.22	0.575	0.9699	45.05	FTM	22.52
	9	NORTHERN DEMOCRATION	CON	230.92	219.49	32.29	10.3	944.9	1.03	0.08	0.8467	178.27	0.5	6.15	0.575	6.2742	190.77	FTM	95.39
	10	NIRBITA	OT	165.80	158.29	27.40	6.9	560.41	1.03	0.05	0.8467	86.13	0.5	4.43	0.8	3.5787	94.19	FTM	47.09
	11	SOPHIA	BC	90.87	86.90	15.00	4.2	297.2	1.03	0.03	0.8467	28.78	0.5	2.43	0.75	0.6138	31.85		31.85
	12	KIRAN ASYA	BC	238.15	226.50	32.24	6.9	774.1	1.03	0.07	0.8467	123.24	0.5	6.34	0.75	5.6487	135.30	306	67.65
	13																		
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	15																		
TOTAL																			

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Thursday, 19 October 2017	1	DONGHAI STAR	BC	228.90	217.53	32.00	7.5	759.2	1.03	0.06	0.8681	135.25	0.5	6.09	0.75	5.8529	147.26	TBN	73.63
	2	TANTO HORAS	CON	97.08	89.95	17.20	6.0	296.3	1.03	0.03	0.8681	44.74	0.5	2.52	0.575	0.7979	48.08		48.08
	3	KATOMAS	OT	105.00	99.00	18.80	4.7	246.28	1.03	0.02	0.8681	38.57	0.5	2.77	0.8	1.0461	42.41	KDJ	21.21
	4	TANTO HANDAL	CON	98.35	89.95	17.40	4.7	301.8	1.03	0.03	0.8681	35.05	0.5	2.52	0.575	0.6323	38.22		38.22
	5	TANTO STAR	CON	147.5	138.00	22.20	6.5	483.1	1.03	0.04	0.8681	74.36	0.5	3.86	0.575	1.7116	79.98	306	39.99
	6	FATIMAH 3	CON	101.10	94.51	19.00	4.8	334.2	1.03	0.03	0.8681	37.61	0.5	2.65	0.575	0.7408	41.02	A14	20.51
	7	NORTHERN DEMOCRAT	CON	230.92	219.49	32.29	9.8	944.9	1.03	0.08	0.8681	178.32	0.5	6.15	0.575	5.9697	190.51	B333	95.26
	8	STAR HIDRA	GC	198.00	187.62	31.00	8.6	815.4	1.03	0.07	0.8681	133.76	0.5	5.25	0.7	5.2337	144.31	FTMH	72.16
	9	MARINA STAR 2	CON	147.50	138.52	22.20	7.4	483.1	1.03	0.04	0.8681	84.98	0.5	3.88	0.575	1.9559	90.85	TBN	45.43
	10	MUTIARA BENOA	CON	134.00	125.98	19.00	3.8	390.4	1.03	0.03	0.8681	39.69	0.5	3.53	0.575	0.7818	44.03	RSTU	22.01
	11	MUTIARA PERSADA 3	PS	151.13	138.00	23.00	6.7	514.8	1.03	0.04	0.8681	76.65	0.5	3.86	0.68	2.1616	82.72	OVI	41.36
	12	TANTO BERKAT	CON	119.32	110.20	18.00	7.1	346.1	1.03	0.03	0.8681	64.86	0.5	3.09	0.575	1.2105	69.19	VTORI	34.59
	13	MS HAWK	CON	222.20	211.03	30.00	10.8	854.4	1.03	0.07	0.8681	188.94	0.5	5.91	0.575	5.8769	200.80	306	100.40
	14	NAVIGATOR GLOBAL	LNG	154.00	145.19	25.52	7.6	492.46	1.03	0.04	0.8681	91.47	0.5	4.07	0.8	3.3674	98.95	333	49.47
	15	KAWA MAS	CON	107.80	100.91	18.00	3.6	327.5	1.03	0.03	0.8681	30.11	0.5	2.83	0.575	0.562	33.53	TBN	16.76
	16	KMTC CENNAI	CON	261.40	249.08	32.25	11.0	1032.2	1.03	0.09	0.8681	227.13	0.5	6.97	0.575	7.5946	241.79	306	120.90
TOTAL																			

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Friday, 20 October 2017	1	ARMADA SEJATI	CON	114.00	106.00	18.20	7.6	341.3	1.03	0.03	0.8467	63.53	0.5	2.97	0.575	1.2602	67.78	A14	33.89
	2	SWARNA BAHTERA	PS	93.00	85.00	16.00	5.5	221.5	1.03	0.02	0.8467	36.87	0.5	2.38	0.68	0.7603	40.02		40.02
	3	LAGUN MAS	GC	96.50	90.80	15.80	6.0	271.4	1.03	0.02	0.8467	42.60	0.5	2.54	0.7	0.8932	46.06	B333	23.03
	4	SENDANG MAS	CON	215.10	204.16	29.92	7.9	833.0	1.03	0.07	0.8467	127.18	0.5	5.72	0.575	4.1477	137.12	B333	68.56
	5	PALUNG MAS	CON	107.80	100.91	18.00	3.7	327.5	1.03	0.03	0.8467	29.44	0.5	2.83	0.575	0.5776	32.87	B333	16.44
	6	SELATAN DAMAI	CON	116.00	108.74	21.00	5.9	397.5	1.03	0.03	0.8467	50.59	0.5	3.04	0.575	1.158	54.83	B333	27.41
	7	WAN HAI 281	CON	182.80	172.93	28.04	7.3	699.2	1.03	0.06	0.8467	99.55	0.5	4.84	0.575	3.0425	107.49	B333	53.75
	8	MERATUS KAMPAR	CON	119.90	115.03	21.80	4.5	420.3	1.03	0.04	0.8467	40.82	0.5	3.22	0.575	0.9699	45.05	FTM	22.52
	9	NORTHERN DEMOCRATION	CON	230.92	219.49	32.29	10.3	944.9	1.03	0.08	0.8467	178.27	0.5	6.15	0.575	6.2742	190.77	FTM	95.39
	10	NIRBITA	OT	165.80	158.29	27.40	6.9	560.41	1.03	0.05	0.8467	86.13	0.5	4.43	0.8	3.5787	94.19	FTM	47.09
	11	SOPHIA	BC	90.87	86.90	15.00	4.2	297.2	1.03	0.03	0.8467	28.78	0.5	2.43	0.75	0.6138	31.85		31.85
	12	KIRAN ASYA	BC	238.15	226.50	32.24	6.9	774.1	1.03	0.07	0.8467	123.24	0.5	6.34	0.75	5.6487	135.30	306	67.65
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TOTAL																			

			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Monday, 23 October 2017	1	ST AYLON	CON	165.00	155.77	26.00	9.2	606.8	1.03	0.05	0.6366	63.89	0.4	2.79	0.575	3.2026	69.94	OV	34.97
	2	DARMA KARTIKA 9	RO	155.00	145.00	19.00	6.0	398.5	1.03	0.03	0.6366	38.79	0.4	2.60	0.68	1.6802	43.10	A.14	21.55
	3	MERATUS KENDARI 1	GC	120.00	110.80	19.60	6.1	378.1	1.03	0.03	0.6366	30.13	0.4	1.99	0.7	1.3861	33.54	RST	16.77
	4	TANTO SENANG	CON	140.00	132.00	20.50	3.4	432.3	1.03	0.04	0.6366	20.01	0.4	2.37	0.575	0.7908	23.20	FTM	11.60
	5	COUGAR	OT	119.00	111.61	19.00	8.7	309.97	1.03	0.03	0.6366	43.29	0.4	2.00	0.8	2.2062	47.52	B333	23.76
	6	SAWU SEA	GC	128.50	121.32	19.00	5.5	381.0	1.03	0.03	0.6366	29.75	0.4	2.17	0.7	1.3266	33.28	B333	16.64
	7	KANAL MAS	CON	119.90	115.00	21.80	4.0	420.3	1.03	0.04	0.6366	20.51	0.4	2.06	0.575	0.8619	23.47	B333	11.73
	8	TRANS PASIFIK 06	TUG	27.50	25.80	8.00	3.1	47.8	1.03	0.00	0.6366	3.51	0.4	0.46	0.5	0.0471	4.02		4.02
	9	PEDHOULAS FARMER	BC	229.00	225.00	32.30	10.1	764.7	1.03	0.06	0.6366	101.31	0.4	4.03	0.75	8.229	113.64	B333	56.82
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TOTAL																			
			BOLLARD PULL REQUIRED																
DATE	NO	SHIP NAME	TYPE	LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Tuesday, 24 October 2017	1	TANTO SENTOSA	CON	105.00	96.10	20.00	6.2	358.8	1.03	0.03	0.5187	17.64	0.3	0.97	0.575	1.0242	19.66	KTJ	9.83
	2	SINAR PAPUA	GC	110.00	103.00	19.70	6.1	362.3	1.03	0.03	0.5187	18.60	0.3	1.04	0.7	1.2951	20.96	KTJ	10.48
	3	DHAMA KARTIKA IX	RO	155.00	145.00	19.00	6.0	398.5	1.03	0.03	0.5187	25.75	0.3	1.46	0.68	1.6802	28.93	FTM	14.46
	4	ANTHOS	BC	225.00	217.40	32.20	8.0	758.4	1.03	0.06	0.5187	51.48	0.3	2.19	0.75	6.2784	60.01	OV-KTJ	30.01
	5	DARYA LOK	BC	229.00	190.97	32.26	9.7	764.0	1.03	0.06	0.5187	54.83	0.3	1.92	0.75	6.6995	63.52	B333	31.76
	6	MERATUS PALEMBANG	GC	117.00	110.00	19.70	5.1	374.7	1.03	0.03	0.5187	16.61	0.3	1.11	0.7	1.1564	18.90	TBN	9.45
	7	SPIL CAYA	CON	231.00	214.20	32.20	8.5	942.5	1.03	0.08	0.5187	53.89	0.3	2.16	0.575	5.039	61.17	TBN	30.58
	8	SERASI 2	VC	107.14	99.98	18.30	5.3	293.1	1.03	0.02	0.5187	15.68	0.3	1.01	0.68	0.9857	17.70	FTM	8.85
	9	TELUK BERAU	CON	114.30	107.60	16.00	4.3	300.4	1.03	0.03	0.5187	13.69	0.3	1.08	0.575	0.6363	15.44	A.14	7.72
	10	TANTO TERANG	CON	144.83	134.25	22.40	7.2	482.1	1.03	0.04	0.5187	28.61	0.3	1.35	0.575	1.861	31.87	FTM	15.93
	11	MERATUS ULTIMA	GC	105.00	97.62	18.20	5.2	326.5	1.03	0.03	0.5187	15.03	0.3	0.98	0.7	0.9667	17.00		17.00
	12	MSC IMMA	CON	201.47	190.97	32.25	8.8	858.4	1.03	0.07	0.5187	49.74	0.3	1.92	0.575	4.6583	56.40	FTM	28.20
	13	ORIENTAL GALAXY	CON	182.83	170.00	28.00	7.1	698.3	1.03	0.06	0.5187	35.73	0.3	1.71	0.575	2.9048	40.40	FTM	20.20
	14	MENTARI SEMANGAT	CON	140.00	132.00	20.50	7.1	432.3	1.03	0.04	0.5187	27.74	0.3	1.33	0.575	1.6513	30.76	FTM	15.38
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TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Wednesday, 25 October 2017	1	MERATUS MEDAN 1	CON	161.85	150.00	25.60	7.6	590.2	1.03	0.05	0.3966	19.72	0.3	1.51	0.575	2.5084	23.79	TBN	11.89
	2	STAR OF LUCK	CON	168.00	158.66	27.20	8.4	642.1	1.03	0.05	0.3966	23.05	0.3	1.60	0.575	3.1158	27.82	TBN	13.91
	3	MERATUS BONTANG	GC	106.68	99.10	20.60	3.5	372.7	1.03	0.03	0.3966	6.00	0.3	1.00	0.7	0.7476	7.78	FTM	3.89
	4	SITU MAS	CON	215.32	205.28	29.80	7.6	830.3	1.03	0.07	0.3966	26.99	0.3	2.07	0.575	3.996	33.12	OV	16.56
	5	CAPE MORETON	CON	221.69	209.62	29.80	9.8	847.3	1.03	0.07	0.3966	35.53	0.3	2.11	0.575	5.2617	42.98	OV	21.49
	6	DOROLONDA	PS	146.50	130.00	23.40	5.0	513.6	1.03	0.04	0.3966	11.24	0.3	1.31	0.68	1.546	14.14		14.14
	7	WARNOW CHIEF	CON	180.36	169.25	25.00	7.8	617.9	1.03	0.05	0.3966	22.84	0.3	1.71	0.575	2.8367	27.43	FTM	13.72
	8	MERATUS GORONTALO	CON	161.85	151.13	25.60	6.8	590.2	1.03	0.05	0.3966	17.78	0.3	1.52	0.575	2.2612	21.61	TBN	10.81
	9	TAL STAR	GC	92.75	86.56	16.00	4.2	269.4	1.03	0.02	0.3966	6.29	0.3	0.87	0.7	0.6086	7.79		7.79
	10	TRANS PASIFIK 06	TUG	27.50	25.80	8.00	3.1	45.3	1.03	0.00	0.3966	1.38	0.3	0.26	0.5	0.0478	1.70		1.70
	11	MENTARI SEMANGAT	CON	140.00	132.00	20.50	5.0	432.3	1.03	0.04	0.3966	11.42	0.3	1.33	0.575	1.1629	13.95	RV2	6.97
	12	INTAN DAYA 11	GC	98.00	92.00	21.00	4.5	363.6	1.03	0.03	0.3966	7.16	0.3	0.93	0.7	0.9097	9.03		9.03
	13	MENTARI SUKSES	GC	85.80	81.12	15.00	6.2	243.2	1.03	0.02	0.3966	8.70	0.3	0.82	0.7	0.7894	10.33	KTJ	5.16
	14	TANTO CERIA	CON	98.84	89.92	16.00	5.0	278.2	1.03	0.02	0.3966	7.78	0.3	0.91	0.575	0.6183	9.33	RU	4.66
	15	MERATUS AMBON	GC	97.20	90.00	15.60	5.9	268.9	1.03	0.02	0.3966	9.19	0.3	0.91	0.7	0.8668	10.98	KTJ	5.49
	16																		
	17																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Thursday, 26 October 2017	1	KAMILA	OT	118.37	111.01	19.00	8.0	306.98	1.03	0.03	0.3151	9.70	0.1	0.12	0.8	2.0178	11.87	TBN	5.93
	2	SPIL NINGSIH	CON	208.30	197.58	29.89	7.0	813.9	1.03	0.07	0.3151	15.10	0.1	0.22	0.575	3.5531	18.95	FTM	9.47
	3	WARNOW CHIEF	CON	180.36	169.25	25.00	7.8	617.9	1.03	0.05	0.3151	14.42	0.1	0.19	0.575	2.8367	17.50	FTM	8.75
	4	EAST GATE	BC	176.60	169.40	26.00	10.0	592.1	1.03	0.05	0.3151	18.50	0.1	0.19	0.75	4.9377	23.68	RO2	11.84
	5	CAPE MORETON	CON	221.69	209.62	29.80	9.8	847.3	1.03	0.07	0.3151	22.44	0.1	0.23	0.575	5.2617	28.00	FTM	14.00
	6	EVER ALLY	CON	165.00	155.77	27.10	6.4	632.4	1.03	0.05	0.3151	10.89	0.1	0.17	0.575	2.3222	13.44	OV	6.72
	7	WHITE MIYAGI	GC	119.99	112.90	21.20	5.3	408.9	1.03	0.03	0.3151	6.54	0.1	0.13	0.7	1.3273	8.02	TBN	4.01
	8	SINAR JEPARA	CON	114.80	107.70	16.20	4.0	304.9	1.03	0.03	0.3151	4.70	0.1	0.12	0.575	0.5998	5.45	RU	2.73
	9	PONA	CON	221.75	210.60	29.86	10.5	849.2	1.03	0.07	0.3151	24.15	0.1	0.24	0.575	5.6752	30.13	OV	15.07
	10	PRATIWI RAYA	GC	96.90	90.80	15.80	4.7	272.0	1.03	0.02	0.3151	4.66	0.1	0.10	0.7	0.7055	5.49	RO2	2.75
	11	KABONGA BARU 2	CON	79.07	71.60	13.40	3.2	209.2	1.03	0.02	0.3151	2.50	0.1	0.08	0.575	0.2639	2.86	RO2	1.43
	12	ORIENTAL GALAXY	CON	182.83	170.00	28.00	7.1	698.3	1.03	0.06	0.3151	13.18	0.1	0.19	0.575	2.9048	16.34	B333	8.17
	13	PALUNG MAS	CON	182.83	170.00	28.00	4.1	698.3	1.03	0.06	0.3151	7.61	0.1	0.19	0.575	1.6774	9.54	B333	4.77
	14	LOUDS ISLAND	CON	215.13	204.19	29.95	8.1	833.9	1.03	0.07	0.3151	18.06	0.1	0.23	0.575	4.2575	22.62	OV	11.31
	15																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Wednesday, 25 October 2017	1	MERATUS MEDAN 1	CON	161.85	150.00	25.60	7.6	590.2	1.03	0.05	0.3966	19.72	0.3	1.51	0.575	2.5084	23.79	TBN	11.89
	2	STAR OF LUCK	CON	168.00	158.66	27.20	8.4	642.1	1.03	0.05	0.3966	23.05	0.3	1.60	0.575	3.1158	27.82	TBN	13.91
	3	MERATUS BONTANG	GC	106.68	99.10	20.60	3.5	372.7	1.03	0.03	0.3966	6.00	0.3	1.00	0.7	0.7476	7.78	FTM	3.89
	4	SITU MAS	CON	215.32	205.28	29.80	7.6	830.3	1.03	0.07	0.3966	26.99	0.3	2.07	0.575	3.996	33.12	OV	16.56
	5	CAPE MORETON	CON	221.69	209.62	29.80	9.8	847.3	1.03	0.07	0.3966	35.53	0.3	2.11	0.575	5.2617	42.98	OV	21.49
	6	DOROLONDA	PS	146.50	130.00	23.40	5.0	513.6	1.03	0.04	0.3966	11.24	0.3	1.31	0.68	1.546	14.14		14.14
	7	WARNOW CHIEF	CON	180.36	169.25	25.00	7.8	617.9	1.03	0.05	0.3966	22.84	0.3	1.71	0.575	2.8367	27.43	FTM	13.72
	8	MERATUS GORONTALO	CON	161.85	151.13	25.60	6.8	590.2	1.03	0.05	0.3966	17.78	0.3	1.52	0.575	2.2612	21.61	TBN	10.81
	9	TAL STAR	GC	92.75	86.56	16.00	4.2	269.4	1.03	0.02	0.3966	6.29	0.3	0.87	0.7	0.6086	7.79		7.79
	10	TRANS PASIFIK 06	TUG	27.50	25.80	8.00	3.1	45.3	1.03	0.00	0.3966	1.38	0.3	0.26	0.5	0.0478	1.70		1.70
	11	MENTARI SEMANGAT	CON	140.00	132.00	20.50	5.0	432.3	1.03	0.04	0.3966	11.42	0.3	1.33	0.575	1.1629	13.95	RV2	6.97
	12	INTAN DAYA 11	GC	98.00	92.00	21.00	4.5	363.6	1.03	0.03	0.3966	7.16	0.3	0.93	0.7	0.9097	9.03		9.03
	13	MENTARI SUKSES	GC	85.80	81.12	15.00	6.2	243.2	1.03	0.02	0.3966	8.70	0.3	0.82	0.7	0.7894	10.33	KTJ	5.16
	14	TANTO CERIA	CON	98.84	89.92	16.00	5.0	278.2	1.03	0.02	0.3966	7.78	0.3	0.91	0.575	0.6183	9.33	RU	4.66
	15	MERATUS AMBON	GC	97.20	90.00	15.60	5.9	268.9	1.03	0.02	0.3966	9.19	0.3	0.91	0.7	0.8668	10.98	KTJ	5.49
	16																		
	17																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Thursday, 26 October 2017	1	KAMILA	OT	118.37	111.01	19.00	8.0	306.98	1.03	0.03	0.3151	9.70	0.1	0.12	0.8	2.0178	11.87	TBN	5.93
	2	SPIL NINGSIH	CON	208.30	197.58	29.89	7.0	813.9	1.03	0.07	0.3151	15.10	0.1	0.22	0.575	3.5531	18.95	FTM	9.47
	3	WARNOW CHIEF	CON	180.36	169.25	25.00	7.8	617.9	1.03	0.05	0.3151	14.42	0.1	0.19	0.575	2.8367	17.50	FTM	8.75
	4	EAST GATE	BC	176.60	169.40	26.00	10.0	592.1	1.03	0.05	0.3151	18.50	0.1	0.19	0.75	4.9377	23.68	RO2	11.84
	5	CAPE MORETON	CON	221.69	209.62	29.80	9.8	847.3	1.03	0.07	0.3151	22.44	0.1	0.23	0.575	5.2617	28.00	FTM	14.00
	6	EVER ALLY	CON	165.00	155.77	27.10	6.4	632.4	1.03	0.05	0.3151	10.89	0.1	0.17	0.575	2.3222	13.44	OV	6.72
	7	WHITE MIYAGI	GC	119.99	112.90	21.20	5.3	408.9	1.03	0.03	0.3151	6.54	0.1	0.13	0.7	1.3273	8.02	TBN	4.01
	8	SINAR JEPARA	CON	114.80	107.70	16.20	4.0	304.9	1.03	0.03	0.3151	4.70	0.1	0.12	0.575	0.5998	5.45	RU	2.73
	9	PONA	CON	221.75	210.60	29.86	10.5	849.2	1.03	0.07	0.3151	24.15	0.1	0.24	0.575	5.6752	30.13	OV	15.07
	10	PRATIWI RAYA	GC	96.90	90.80	15.80	4.7	272.0	1.03	0.02	0.3151	4.66	0.1	0.10	0.7	0.7055	5.49	RO2	2.75
	11	KABONGA BARU 2	CON	79.07	71.60	13.40	3.2	209.2	1.03	0.02	0.3151	2.50	0.1	0.08	0.575	0.2639	2.86	RO2	1.43
	12	ORIENTAL GALAXY	CON	182.83	170.00	28.00	7.1	698.3	1.03	0.06	0.3151	13.18	0.1	0.19	0.575	2.9048	16.34	B333	8.17
	13	PALUNG MAS	CON	182.83	170.00	28.00	4.1	698.3	1.03	0.06	0.3151	7.61	0.1	0.19	0.575	1.6774	9.54	B333	4.77
	14	LOUDS ISLAND	CON	215.13	204.19	29.95	8.1	833.9	1.03	0.07	0.3151	18.06	0.1	0.23	0.575	4.2575	22.62	OV	11.31
	15																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Monday, 29 October 2017	1	CUCKOO HUNTER	CON	260.10	247.81	32.30	9.7	1030.0	1.03	0.09	0.4158	45.72	0.3	2.50	0.575	6.6734	54.98	OV	27.49
	2	ARMADA PURNAMA	GC	98.00	92.80	15.80	6.4	273.5	1.03	0.02	0.4158	11.30	0.3	0.94	0.7	0.9819	13.24	OV	6.62
	3	PULAU NUNUKAN	GC	119.20	112.00	20.80	5.5	399.7	1.03	0.03	0.4158	11.72	0.3	1.13	0.7	1.3407	14.22	KTJ	7.11
	4	TB. CUMAWUS	TUG	29.00	26.44	8.00	2.5	48.3	1.03	0.00	0.4158	1.26	0.3	0.27	0.5	0.0395	1.57		1.57
	5	ORIENTAL DIAMOND	CON	195.60	187.13	30.20	10.3	787.9	1.03	0.07	0.4158	36.66	0.3	1.89	0.575	5.0031	43.62	KTJ	21.81
	6	MERATUS KAMPAR	CON	119.90	115.03	21.80	4.6	420.3	1.03	0.04	0.4158	10.07	0.3	1.16	0.575	0.9915	12.25		12.25
	7	SLAMET 6	TUG	31.00	28.30	8.60	3.0	55.4	1.03	0.00	0.4158	1.61	0.3	0.29	0.5	0.0546	1.96	KTJ	0.98
	8	SINAR AMBON	CON	92.00	85.84	20.00	4.8	335.5	1.03	0.03	0.4158	7.84	0.3	0.87	0.575	0.7083	9.44	FTM	4.72
	9	MARINA STAR 1	CON	147.50	138.52	22.20	7.6	483.1	1.03	0.04	0.4158	20.03	0.3	1.40	0.575	2.0088	23.47	FTM	11.74
	10	KOTA JUTA	CON	193.03	181.54	28.00	8.9	724.0	1.03	0.06	0.4158	30.73	0.3	1.83	0.575	3.8884	36.51	B333	18.26
	11	HONGKONG BRIDGE	CON	259.80	244.80	32.30	10.7	1029.1	1.03	0.09	0.4158	49.82	0.3	2.47	0.575	7.2719	59.65	B333	29.83
	12	TANTO SEMANGAT	CON	140.00	132.93	20.50	7.5	432.3	1.03	0.04	0.4158	18.96	0.3	1.34	0.575	1.7567	22.10	B333	11.05
	13	URU BHUM	CON	194.93	186.00	32.30	10.5	840.7	1.03	0.07	0.4158	37.15	0.3	1.87	0.575	5.4219	44.52	KTJ	22.26
	14	NAVIGATOR GLOBAL	LPG	154.00	147.00	25.50	7.6	592.04	1.03	0.05	0.4158	21.25	0.3	1.48	0.8	3.4068	26.19	KTJ	13.09
	15	MITRA KENDARI	CON	121.00	113.52	18.00	7.0	348.8	1.03	0.03	0.4158	15.12	0.3	1.14	0.575	1.2294	17.52	KTJ	8.76
	16	LAGUN MAS	GC	96.50	90.80	15.80	5.0	271.4	1.03	0.02	0.4158	8.64	0.3	0.92	0.7	0.7506	10.32	B333	5.16
	17	LUMOSO SELAMAT	CON	106.80	99.10	20.80	4.7	376.6	1.03	0.03	0.4158	8.86	0.3	1.00	0.575	0.8327	10.72	RST	5.36
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Sunday, 30 October 2017	1	FELYA	GC	104.20	96.00	18.50	6.0	330.6	1.03	0.03	0.508	16.35	0.1	0.11	0.7	1.115	17.60	RST	8.80
	2	CHUKO HUNTER	CON	260.10	247.81	32.30	9.0	1030.0	1.03	0.09	0.508	63.32	0.1	0.28	0.575	6.1918	69.87	OV	34.94
	3	SINAR AMBON	CON	92.00	85.84	20.00	4.8	335.5	1.03	0.03	0.508	11.70	0.1	0.10	0.575	0.7083	12.53		12.53
	4	NOTHERN DEFENDER	CON	231.00	219.56	32.29	10.0	945.2	1.03	0.08	0.508	62.33	0.1	0.25	0.575	6.0936	68.75	OV	34.38
	5	DUTA KAPUAS	TUG	27.00	24.58	8.00	2.5	47.7	1.03	0.00	0.508	1.74	0.1	0.03	0.5	0.0367	1.81		1.81
	6	ISA EXPRESS	BC	185.70	177.00	30.40	11.0	681.3	1.03	0.06	0.508	55.27	0.1	0.20	0.75	6.6356	62.16	TBN	31.08
	7	ARMADA PERMATA	CON	129.10	121.28	24.20	7.1	486.6	1.03	0.04	0.508	24.45	0.1	0.14	0.575	1.7911	26.41	JYB	13.21
	8	SPIL CAYA	CON	231.00	214.20	32.20	8.3	942.5	1.03	0.08	0.508	50.47	0.1	0.24	0.575	4.9204	55.71	OV	27.86
	9	MENTARI PRAKARSA	GC	112.00	104.92	16.00	5.0	297.1	1.03	0.03	0.508	14.89	0.1	0.12	0.7	0.8782	15.91	FTM	7.96
	10	MUTIARA FERINDO	PS	166.00	156.74	25.00	5.4	621.8	1.03	0.05	0.508	24.03	0.1	0.18	0.68	2.1508	26.41	FTM	13.20
	11	TIGA RODA	BC	129.50	123.80	20.60	7.4	441.6	1.03	0.04	0.508	26.01	0.1	0.14	0.75	2.1157	28.30	B333	14.15
	12																		
	13																		
	14																		
TOTAL																			

DATE	NO	SHIP NAME	TYPE	BOLLARD PULL REQUIRED																
				LOA	LBP	B	T	AL	V_{wind}	F_{wind}	$V_{current}$	FC	H_{wave}	F_{wave}	Cb	F_{moor}	BOLLARD PULL	TUG /	BOLLARD PULL
				m	m	m	m	m^2	m/s	Ton	m/s	Ton	m	Ton		Ton	Ton	ASSIST	REQUIRED (Ton)
Tuesday, 31 October 2017	1	AS CONSTANTINA	CON	221.69	209.62	29.80	8.7	847.3	1.03	0.07	0.6002	72.26	0.4	3.76	0.575	4.6711	80.76	B333	40.38
	2	DARWIN	BC	224.89	215.00	32.20	8.6	758.2	1.03	0.06	0.6002	73.27	0.4	3.85	0.75	6.6747	83.86	B333	41.93
	3	RORO SAWITRI	GC	118.10	108.00	19.60	5.4	374.7	1.03	0.03	0.6002	23.11	0.4	1.94	0.7	1.1961	26.27	RU	13.14
	4	DA CHENG	GC	93.00	87.00	16.00	6.0	269.8	1.03	0.02	0.6002	20.68	0.4	1.56	0.7	0.8739	23.14	B333	11.57
	5	AS SAVONIA	CON	168.00	158.00	27.20	8.5	642.1	1.03	0.05	0.6002	53.22	0.4	2.83	0.575	3.1397	59.24	B333	29.62
	6	MERATUS SABANG	GC	98.00	92.15	16.50	4.3	285.7	1.03	0.02	0.6002	15.70	0.4	1.65	0.7	0.6841	18.06		18.06
	7	HIJAU JELITA	CON	135.80	127.00	23.00	6.3	476.4	1.03	0.04	0.6002	31.70	0.4	2.28	0.575	1.5817	35.60	OV	17.80
	8	ORIENTAL MUTIARA	GC	176.59	166.94	27.51	7.2	670.7	1.03	0.06	0.6002	47.63	0.4	2.99	0.7	3.46	54.14	OV	27.07
	9	NORTHERN DEFENDER	CON	231.00	219.56	32.29	10.0	945.2	1.03	0.08	0.6002	87.00	0.4	3.93	0.575	6.0936	97.11	OV	48.55
	10	MUTIARA FERINDO 1	PS	166.00	156.74	25.00	5.4	621.8	1.03	0.05	0.6002	33.54	0.4	2.81	0.68	2.1508	38.55	TBN	19.27
	11	MENTARI TRADER	GC	79.27	73.74	12.00	6.0	187.5	1.03	0.02	0.6002	17.53	0.4	1.32	0.7	0.5556	19.43		19.43
	12	MERATUS GORONTALO	CON	161.85	151.13	25.60	7.3	590.2	1.03	0.05	0.6002	43.72	0.4	2.71	0.575	2.4275	48.90	OV	24.45
	13	AS CONSTANTINA	CON	221.69	209.62	29.80	8.9	847.3	1.03	0.07	0.6002	73.92	0.4	3.76	0.575	4.7785	82.53	B333	41.27
	14	AS SAVONIA	CON	168.00	158.00	27.20	8.5	642.1	1.03	0.05	0.6002	53.22	0.4	2.83	0.575	3.1397	59.24	B333	29.62
	15																		
	16																		
	17																		
TOTAL																			

ATTACHMENT 1
TIME OPERATION

KT. KRESNA 315

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME		QUAY	TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END	minutes	minutes	minutes	minutes		minutes	minutes	minutes	minutes
Sunday, 01 October 2017	1	TANTO FAJAR 1	RD	BB	00.40	02.05	01.15	02.00		40	35	75			35	45	80
	2	TANTO SEMANGAT	TL	RD	02.38		03.10	03.34	118	32	24	56			50	40	90
	3	MERATUS MALINO	RD	TL		04.36	03.41	04.11		5	30	35			50	40	90
	4	AWLI	JU	RD	07.50	08.30	08.06	08.12	194	35	35	70		130	35	35	70
	5	MENTAYA RIVER	MRH	RD	09.03	09.58	09.19	09.30	33	34	11	45			40	35	75
	6	RED ROCK	RD	MRH	10.10		10.26	11.09		16	43	59			55	45	100
	7	SINAR BELAWAN	RD	TL			12.23	12.47		14	24	38			45	45	90
	8	KOTA JUTA	ICT	RD			13.19	13.32		31	13	44			15	35	50
	9	SPIL NIKEN	BT	RD		15.15	14.23	15.03		63	40	103			75	50	125
	10	SPIL NITA	RD	BB	17.40	19.06	18.12	18.53	85	45	41	86		110	30	60	90
	11	PAN DAISY	RD	JU	19.58	21.00	20.10	20.48	52	12	38	50			70	40	110
	12	SEASPAN FRASER	ICT	RD	22.07		22.47	23.19	67	40	32	72			50	40	90
	13	UNI FORTUNA	ICT	RD		24.30	23.29	23.39		20	10	30			35	35	70
TOTAL																	
					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Monday, 02 October 2017	1	KANG MAY	RD	BGS	00.30	02.00	00.39	01.38		31	59	90			60	60	120
	2	GUENTHER SCHUTLE	RD	ICT	02.55		03.34	04.15	55	39	41	80		40	30	60	90
	3	STRAIT MAS	RD	TL		05.35	04.33	05.03		50	30	80			10	45	55
	4	PULAU HOKI	RD	ICT	06.06	07.12	06.21	06.39	31	48	18	66			75	50	125
	5	PALU SIPAT	SMP	RD	08.55		09.37	09.50	91	42	17	59		95	30	35	65
	6	MERATUS GORONTALO	RD	NT			10.22	11.04		32	42	74			50	45	95
	7	DUTA KAPUAS 17	RD	INTAN			11.51	13.31		47	100	147		25	30	60	90
	8	MITRA SEJAHTERA IX	BT	RD		15.00	14.28	14.34		83	6	89			75	35	110
	9	MERATUS GORONTALO	NT	RD	17.45		18.44	18.54	165	59	10	69		145	30	35	65
	10	TIGA RODA	RD	NT			19.32	20.20		38	48	86			30	60	90
	11	INTAN DAYA 4	TL	RD		22.30	21.38	21.56		109	18	127			110	35	145
	12																
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	15																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Tuesday, 03 October 2017	1	OLYMPIA	ICT	RD	02.13	03.53	02.46	03.28	223	58	42	100		225	30	40	70
	2	KOTA NABIL	RD	ICT	04.14		04.54	05.27	86	40	33	73			70	45	115
	3	TANTO LUAS	BB	RD			06.19	06.36		52	17	69			35	35	70
	4	CJN 2	RD	JS			07.19	07.59		43	40	83			35	40	75
	5	FREIGH EXPRESS 1	RD	NT		09.45	08.29	09.25		50	56	106			75	45	120
	6	MENTARI PRATAMA	RD	BB	11.29		11.38	12.16	104	9	38	47		75	30	35	65
	7	STAR OF LUCK	RD	ICT		14.16	12.59	13.51		68	52	120			40	110	150
	8	MERATUS PALEMBANG	RD	BU	14.47		15.16	15.54	31	29	38	67			10	45	55
	9	SINAR AMBON	RD	BT			16.10	16.47		16	37	53			25	40	65
	10	ISA EXPRESS	JS	RD			17.45	18.03		58	18	76			35	35	70
	11	PAC SCHEDAR	RD	JB			18.58	19.46		55	48	103			60	45	105
	12	MERATUS BONTANG	RD	NT			20.17	20.47		31	30	61			30	35	65
	13	SENDANG MAS	RD	TL		23.00	21.15	22.23		65	68	133			70	60	130
	14																
	15																
	16																
	17																
TOTAL																	
					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Wednesday, 04 October 2017	1	URU BHUM	RD	ICT	23.45		00.25	00.58	45	40	33	73		30	30	60	90
	2	MERATUS BANJAR 1	RD	BT		03.20	02.15	02.56		101	41	142			105	45	150
	3	PULAU HOKI	RD	NT	06.28		06.48	07.12	188	20	24	44		150	40	35	75
	4	TANTO TERANG	BB	RD			07.58	08.40		46	42	88			40	50	90
	5	PALUNG MAS	RD	TL			09.12	09.30		32	18	50			15	40	55
	6	ARMADA PERMATA	TL	RD			09.40	09.56		10	16	26			5	35	40
	7	ARMADA SERASI	RD	BU			10.49	11.26		53	37	90			35	35	70
	8	DUTA KAPUAS	RD	NT			11.42	12.46		16	64	80			50	25	75
	9	SPRING MAS	ICT	RD			13.59	13.21		73	22	95			15	35	50
	10	MERATUS KARIANGAU	RD	NT		14.40	13.38	14.11		46	33	79			30	35	65
	11	EVER ALLY	RD	ICT	16.00		16.29	17.06	80	29	37	66		80	30	40	70
	12	NAVIGATOR ARIES	RD	AKR			17.41	18.43		35	62	97			40	55	95
	13	DRAGON LUCKY	JU	RD			19.03	19.13		20	10	30			5	35	40
	14	URU BHUM	ICT	RD			20.06	20.32		53	26	79			35	35	70
	15	SPRING MAS	RD	BT		22.30	20.47	22.00		45	73	118			35	80	115
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Thursday, 05 October 2017	1	GRIYA AMBON	SMP	RD	00.00		00.34	00:56	90	34	22	56		90	40	35	75
	2	LEO PERDANA	RD	ICT		03.00	01.54	02.35		83	41	124			85	40	125
	3	PALUNG MAS	TL	RD	04.30	05.48	05.24	05.30	90	72	6	78		70	40	35	75
	4	MERATUS BORNEO	BT	RD	06.06		06.19	06.30	18	13	11	24			15	35	50
	5	GAMALISE	RD	BT			06.48	07.18		18	30	48			10	35	45
	6	FREIGH EXPRESS	NT	RD			07.35	07.54		17	19	36			10	35	45
	7	TANTO HARMONI	MRH	RD			08.10	08.24		16	14	30			5	35	40
	8	KANG MAY	BGSR	RD			08.30	08.52		6	22	28			5	15	20
	9	MENTAYA RIVER	MSP	RD			09.10	09.28		18	18	36			5	35	40
	10	CSCL KINGSTON	RD	ICT			10.22	10.46		54	24	78			25	45	70
	11	MERATUS TANGGUH 1	RD	MRH		12.15	11.22	11.56		36	34	70			55	40	95
	12	EVER ALLY	ICT	RD	13.50		14.46	14.55	95	56	9	65		70	35	35	70
	13	SURYA PEKIK	RD	TL		16.20	15.24	15.59		50	35	85			40	50	90
	14	YOU SHEN 3	RD	AKR	18.30	20.10	19.15	19.30	130	85	15	100		130	60	40	100
	15	TANTO TENANG	RD	TL	21.00		21.41	22.14	50	41	33	74		50	30	45	75
	16	ARMADA SERASI	BU	RD		23.42	22.50	23.13		65	23	88			45	50	95
	17																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Friday, 06 October 2017	1	TELUK BERAU	BT	RD	01.07	01.54	01.30	01.45	85	42	15	57		55	15	40	55
	2	ORIENTAL EMERALD	RD	ICT	02.27	03.41	02.46	03.16	33	44	30	74			55	85	140
	3	TANTO HANDAL	RD	BB	04.30		05.05	05.31	49	35	26	61		30	30	40	70
	4	MERATUS DILI	TL	RD			06.31	07.05		60	34	94			45	35	80
	5	KUWIANG	RD	JU			07.49	08.38		44	49	93			35	60	95
	6	SERASI 1	MRH	RD			08.57	09.16		19	19	38			10	35	45
	7	SPIL CAYA	BT	RD			09.25	10.07		9	42	51			5	45	50
	8	TANTO SUBUR 2	RD	NT			10.28	10.48		21	20	41			15	35	50
	9	CSCL COSCO SAOPAULO	RD	ICT			12.14	12.57		86	43	129			75	45	120
	10	ORIENTAL GOLD	RD	NT		14.40	13.26	14.10		59	44	103			60	45	105
	11	SPIL CITRA	RD	BT	15.35		16.13	16.52	55	38	39	77		50	30	55	85
	12	PRATAMA 1	NT	RD		18.43	18.15	18.22		104	7	111			80	40	120
	13	MAHKOTA NUSANTARA	RD	JU	19.40		20.16	20.47	53	36	31	67		40	30	40	70
	14	LINTAS BATANGHARI	BB	RD		22.05	21.00	21.19		59	19	78			45	35	80
	15	OOCL NORFOLK	RD	TL	22.30	00.00	23.01	23.59	25	32	58	90		25	60	60	120
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Thursday, 05 October 2017	1	GRIYA AMBON	SMP	RD	00.00		00.34	00:56	90	34	22	56		90	40	35	75
	2	LEO PERDANA	RD	ICT		03.00	01.54	02.35		83	41	124			85	40	125
	3	PALUNG MAS	TL	RD	04.30	05.48	05.24	05.30	90	72	6	78		70	40	35	75
	4	MERATUS BORNEO	BT	RD	06.06		06.19	06.30	18	13	11	24			15	35	50
	5	GAMALISE	RD	BT			06.48	07.18		18	30	48			10	35	45
	6	FREIGH EXPRESS	NT	RD			07.35	07.54		17	19	36			10	35	45
	7	TANTO HARMONI	MRH	RD			08.10	08.24		16	14	30			5	35	40
	8	KANG MAY	BGSR	RD			08.30	08.52		6	22	28			5	15	20
	9	MENTAYA RIVER	MSP	RD			09.10	09.28		18	18	36			5	35	40
	10	CSCL KINGSTON	RD	ICT			10.22	10.46		54	24	78			25	45	70
	11	MERATUS TANGGUH 1	RD	MRH		12.15	11.22	11.56		36	34	70			55	40	95
	12	EVER ALLY	ICT	RD	13.50		14.46	14.55	95	56	9	65		70	35	35	70
	13	SURYA PEKIK	RD	TL		16.20	15.24	15.59		50	35	85			40	50	90
	14	YOU SHEN 3	RD	AKR	18.30	20.10	19.15	19.30	130	85	15	100		130	60	40	100
	15	TANTO TENANG	RD	TL	21.00		21.41	22.14	50	41	33	74		50	30	45	75
	16	ARMADA SERASI	BU	RD		23.42	22.50	23.13		65	23	88			45	50	95
	17																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Friday, 06 October 2017	1	TELUK BERAU	BT	RD	01.07	01.54	01.30	01.45	85	42	15	57		55	15	40	55
	2	ORIENTAL EMERALD	RD	ICT	02.27	03.41	02.46	03.16	33	44	30	74			55	85	140
	3	TANTO HANDAL	RD	BB	04.30		05.05	05.31	49	35	26	61		30	30	40	70
	4	MERATUS DILI	TL	RD			06.31	07.05		60	34	94			45	35	80
	5	KUWIANG	RD	JU			07.49	08.38		44	49	93			35	60	95
	6	SERASI 1	MRH	RD			08.57	09.16		19	19	38			10	35	45
	7	SPIL CAYA	BT	RD			09.25	10.07		9	42	51			5	45	50
	8	TANTO SUBUR 2	RD	NT			10.28	10.48		21	20	41			15	35	50
	9	CSCL COSCO SAOPAULO	RD	ICT			12.14	12.57		86	43	129			75	45	120
	10	ORIENTAL GOLD	RD	NT		14.40	13.26	14.10		59	44	103			60	45	105
	11	SPIL CITRA	RD	BT	15.35		16.13	16.52	55	38	39	77		50	30	55	85
	12	PRATAMA 1	NT	RD		18.43	18.15	18.22		104	7	111			80	40	120
	13	MAHKOTA NUSANTARA	RD	JU	19.40		20.16	20.47	53	36	31	67		40	30	40	70
	14	LINTAS BATANGHARI	BB	RD		22.05	21.00	21.19		59	19	78			45	35	80
	15	OOCL NORFOLK	RD	TL	22.30	00.00	23.01	23.59	25	32	58	90		25	60	60	120
TOTAL																	

					AIS WORKING HOUR								DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Monday, 09 October 2017	1	MERATUS SABANG	RD	MRH	02.30	04.00	03.02	03.35	223	57	33	90		210	70	100	170
	2	BBC AFRICA	BT	RD	07.30		08.01	08.43	210	31	42	73		130	30	45	75
	3	SPIL NIKEN	BT	RD			08.55	09.31		12	36	48			5	40	45
	4	CITRA KARYA PAPUA	RD	MRH			10.15	10.56		44	41	85			40	50	90
	5	MERATUS GORONTALO	RD	BT			11.29	12.01		33	32	65			15	45	60
	6	MERATUS KARIMATA	RD	BT			12.22	12.55		21	33	54			15	45	60
	7	SITU MAS	RD	TL			13.23	13.49		28	26	54			15	45	60
	8	MARINA STAR 2	RD	TL		15.30	14.05	14.45		61	40	101			35	55	90
	9	AYER MAS	RD	ICT	17.10		17.40	18.09	100	45	29	74		100	30	35	65
	10	TOMINI DIGNITY	RD	JU		18.24	19.30	20.40		25	70	95			75	75	150
	11	MUTIARA PERSADA 3	JU	RD	19.05		20.50	21.25	41	10	35	45			5	35	40
	12	BALLENITA	ICT	RD		23.20	22.30	22.47		98	17	115			70	45	115
	13																
	14																
	16																
	17																
TOTAL																	
					AIS WORKING HOUR								DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Tuesday, 10 October 2017	1	KABOGA BARU	BT	RD	00.30		01.12	01.26	70	42	14	56		70	30	35	65
	2	MEDELIN EXPO	SMP	RD			02.43	02.49		77	5	82			45	60	105
	3	SPIL NINGSIH	RD	BT		04.15	03.13	03.52		47	39	86			35	55	90
	4	TANTO BAGUS	RD	BB	05.30		06.18	07.00	75	48	42	90		60	30	60	90
	5	MERATUS BANJAR 1	RD	NT			07.22	07.46		22	24	46			15	35	50
	6	LINTAS ASAHAN	RD	BB		09.00	08.21	08.44		51	23	74			50	35	85
	7	MERATUS BORNEO	RD	BB	11.30		12.03	12.41	210	33	38	71		135	30	45	75
	8	MERATUS MALINO	RD	NT		14.30	13.21	14.10		60	49	109			65	70	135
	9	AYER MAS	ICT	RD	14.55		15.35	15.50	25	40	15	55		15	30	35	65
	10	GRIYA MELAYU	AKR	RD			16.59	17.18		69	19	88			30	60	90
	11	PULAU HOKI	RD	ICT			18.13	18.34		55	21	76			20	40	60
	12	TIGER SUMMER	RD	AKR			19.09	19.36		33	27	60			30	45	75
	13	LAGUN MAS	RD	ICT		21.15	20.04	20.26		77	22	99			45	45	90
	14																
	15																
TOTAL																	

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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Wednesday, 11 October 2017	1	NRS 5	RD	SFM	23.15	01.00	23.57	00.38	120	64	41	105		136	60	45	105
	2	RELIANCE	MRH	RD	02.00	03.10	02.33	02.45	60	58	12	70		30	60	35	95
	3	INTAN DAYA	TL	RD	04.50		05.46	06.10	100	56	24	80		90	40	40	80
	4	TANTO HEMAT	BB	RD			06.40	07.01		30	21	51			20	35	55
	5	WARNOW CHIEF	RD	ICT			07.46	08.15		45	29	74			35	45	80
	6	BILITON 15	RD	NT		10.07	08.27	09.56		23	29	52			25	60	85
	7	LEGUNDI	RD	JU	10.30		10.50	11.05	23	20	15	35			30	40	70
	8	LAGUN MAS	ICT	RD			11.20	11.26		28	6	34			5	35	40
	9	AYER MAS	RD	ICT		13.39	12.07	12.36		41	29	70			30	35	65
	10	ISA GLORY	RD	MSPION	13.59	17.00	14.34	15.39	20	35	5	40			165	70	235
	11	TIMUR LAUT MAS	MRH	RD	18.20	20.12	18.57	19.37	80	72	40	112		100	30	50	80
	12	SPIL NINGSIH	BT	RD	20.30	21.40	20.54	21.24		40	30	70			65	40	105
	13	MERATUS BENOA	MRH	RD	22.30	23.40	22.57	23.07	50	60	10	70			100	35	135
	14																
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					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Thursday, 12 October 2017	1	PULAU HOKI	RD	NT	02.30		03.00	03.35	170	30	35	65		170	30	35	65
	2	AYER MAS	ICT	RD			03.55	04.12		20	14	34			10	35	45
	3	SAWU SEA	TL	RD		05.30	05.00	05.20		58	20	78			20	40	60
	4	MARINA STAR 2	NT	RD	05.52		05.59	06.11	22	7	12	19			20	40	60
	5	LUMOSO SELAMAT	BB	RD		07.12	06.26	06.42		42	16	58			5	35	40
	6	PRAKA VENTURE	RD	JS	07.40		07.54	08.38	28	14	44	58			70	60	130
	7	ARMADA SETIA	RD	NT		10.15	09.23	09.57		63	34	97			40	40	80
	8	CHILOE ISLAND	RD	ICT	13.20		14.01	14.30	185	41	29	70		170	30	40	70
	9	Tb. DRAKO VALIANT	RD	SPR		16.00	14.57	15.38		49	41	90			60	50	110
	10	TELUK FLAMINGGO	RD	BB	18.30	19.25	18.43	19.19	150	19	36	55		100	60	40	100
	11	OCEAN SUKSES	BGS	RD	21.50	23.15	22.26	22.49	145	62	23	85		120	60	40	100
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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Friday, 13 October 2017	1	ASIA PESONA	BT	RD	00.30	02.00	01.06	01.30	75	66	24	90		50	60	40	100
	2	KIRAN ASYA	RD	JU	03.30	05.30	03.46	05.00	90	46	74	120		90	60	60	120
	3	MENTARI EXPRESS	JU	RD	06.00	06.55	06.29	06.42	30	42	13	55		30	20	40	60
	4	SINAR SUMBA	RD	ICT	07.21		07.59	08.29	26	38	30	68			50	35	85
	5	FATIMA 3	RD	BB		09.39	08.41	09.25		26	44	70			55	45	100
	6	TANTO SEMANGAT	RD	TL	10.34	12.37	11.29	12.03	55	89	34	123		40	80	50	130
	7	ORIENTAL MUTIARA	BT	RD	13.10	14.48	13.37	13.53	33	27	16	43		20	35	35	70
	8	BILITON 15	NT	RD	14.52	15.30	14.48	14.59	14	86	11	97			45	35	80
	9	SEGARA MAS	RD	TL	17.00		17.39	18.13	150	39	34	73		80	35	40	75
	10	LEGUNDI	RD	JU			18.40	18.57		27	17	44			10	35	45
	11	HAPPY STAR	JS	RD			19.17	19.27		20	10	30			5	35	40
	12	ANSAC COLOMBIA	RD	JU		21.10	19.45	20.43		45	58	103			40	60	100
	13	LOGISTIC NUSANTARA	RD	JS	22.40	00.20	23.11	23.45	90	66	34	100		80	65	35	100
	14																
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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Saturday, 14 October 2017	1	KOTA JUTA	RD	KT	00.30	02.10	01.13	01.39	10	74	26	100			65	45	110
	2	TANTO HEMAT	RD	NT	02.40	04.20	03.18	03.36	30	82	18	100		30	60	40	100
	3	LINTAS BARITO	RD	BB	06.30		07.06	07.20	130	36	14	50		120	30	35	65
	4	MERATUS PEKAN BARU	TL	RD		09.10	07.47	08.37		60	50	110			70	45	115
	5	PRATAMA 3	RD	NT	09.50		10.30	11.08	40	40	38	78		30	30	60	90
	6	MUTIARA PERSADA	JU	RD			12.33	12.57		75	24	99			65	35	100
	7	SINAR AMBON	RD	BB		14.40	13.33	14.09		67	36	103			60	40	100
	8	TELUK BERAU	RD	BB	15.05	16.30	15.37	16.13	25	49	36	85		25	60	40	100
	9	NAJADE	RD	ICT	17.10		17.48	18.17	40	38	29	67		25	30	40	70
	10	MSC IMMA	ICT	RD			18.46	19.23		29	37	66			25	45	70
	11	TANTO LESTARI	BB	RD			19.44	19.58		21	14	35			10	35	45
	12	LUNA BLUE	JU	RD		22.18	20.48	21.07		50	19	69			35	35	70
	13	MERATUS SABANG	MRH	RD	22.32		21.37	22.10	14	30	33	63			5	40	45
	14	NORD PLUTO	TL	RD			23.01	23.29		51	28	79			50	25	75
	15	MERATUS KELIMUTU	RD	BU		00.14	23.42	00.14		13	32	45			35	35	70
TOTAL																	

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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Sunday, 15 October 2017	1	SPIL NIRMALA	BT	RD	00.14		00.26	00.43		12	17	29			30	40	70
	2	KARUNIA SEJATRA	RD	BT		02.10	01.29	01.53		63	24	87			55	35	90
	3	KOTA JUTA	ICT	RD	05.50	07.12	06.33	06.41	220	74	8	82		200	35	35	70
	4	LOGISTIC NUSANTARA	JS	RD	08.26	09.30	08.47	08.55	74	56	8	64			115	35	150
	5	MILA UTAMA	RD	JU	10.00		10.57	11.14	30	57	17	74		30	40	35	75
	6	ANUGRAH BUANA 8	MRH	RD			11.31	11.39		36	8	44			10	35	45
	7	PRATIWI RAYA	TL	RD			12.45	12.56		51	11	62			20	45	65
	8	MAHAKAMAH 1	SMPR	RD			13.43	13.57		43	14	57			30	35	65
	9	TANTO SUBUR 1	BB	RD		15.39	14.56	15.12		31	8	39			35	75	110
	10	SERASI 1	RD	MRH	17.00		17.32	18.12	81	32	40	72		60	30	50	80
	11	SEGARA MAS	TL	RD			18.45	19.10		33	25	58			30	40	70
	12	MERATUS BATAM	NT	RD		21.45	20.50	21.30		115	40	155			110	40	150
	13	AAMMONIA BOROLINA	ICT	RD	23.10	00.23	23.18	00.23	85	8	65	73		70	65	45	110
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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Monday, 16 October 2017	1	ANSAC COLOMBIA	JU	RD	00.00		00.39	00.53		39	14	53			25	35	60
	2	TANTO BERSINAR	BB	RD		01.40	01.03	01.25		25	22	47			35	35	70
	3	LUMOSO GEMBIRA	RD	BB	04.30	06.00	05.04	05.40		54	36	90		140	65	45	110
	4	RSP 2	NT	RD	06.30		07.17	07.32		47	15	62		10	30	35	65
	5	NOAH 7	RD	JS		10.00	08.48	09.36		100	48	148			85	60	145
	6	NORTHERN VIVACITY	RD	ICT	11.30		11.57	12.36		30	39	69		90	30	40	70
	7	TANTO RAYA	BB	RD		14.20	13.12	13.42		30	30	60			60	40	100
	8	ORIENTAL EMERALD	RD	BB	16.00		16.30	17.12		30	42	72		100	30	50	80
	9	TAICHUNG	RD	ICT		19.00	17.55	18.32		25	37	62			55	45	100
	10	CSCL SANTIAGO	RD	ICT	20.00		20.25	20.56		30	31	61		60	30	45	75
	11	KOTA NASRAT	RD	ICT			21.50	22.30		35	40	75			35	40	75
	12	MENTARI SUCCESS	BB	RD		00.00	23.05	23.46		20	41	61			50	60	110
	13																
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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Tuesday, 17 October 2017	1	NORTHERN VIVACITY	ICT	RD	05.30		06.09	06.37		39	28	67		310	35	35	70
	2	KISIK MAS	RD	ICT			07.33	08.10		56	37	93			50	45	95
	3	PEK 246	DOCK	RD		09.43	08.42	09.26		49	44	93			60	45	105
	4	MT. KATO MAS	RD	SMP	12.30		12.49	13.22	167	19	33	52		150	20	40	60
	5	PEKAN FAJAR	RD	TL		15.20	14.27	14.42		103	15	118			65	30	95
	6	NAVIGATOR ARIES	AKR	RD	15.50	17.20	16.19	16.34	30	75	15	90		20	65	35	100
	7	CSCL SANTIAGO	ICT	RD	18.50		19.26	19.52	90	36	26	62		90	30	40	70
	8	TAICHUNG	ICT	RD			19.57	20.10		5	13	18			5	35	40
	9	NEW GLORY	TL	RD		22.22	21.06	21.50		88	44	132			50	60	110
	10	DAHLIA	RD	ICT	23.10	00.25	23.50	00.25	48	40	35	75		40	125	35	160
	11																
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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Wednesday, 18 October 2017	1	NORDWOGE	RD	ICT	00.25		00.47	01.45		22	58	80			30	45	75
	2	TANTO PERMAI	RD	BB			01.51	02.43		6	52	58			30	40	70
	3	GULF MAS	TL	RD		04.18	03.24	03.48		71	24	95			65	30	95
	4	MERATUS MAKASSAR	BT	RD	05.00	06.20	05.34	06.02	42	52	28	80		35	60	35	95
	5	NIRBITA	RD	SMP	06.50		07.44	08.28	30	54	44	98		15	35	60	95
	6	NOAH 7	JS	RD		09.34	08.46	09.16		36	30	66			55	40	95
	7	SAVIOUR	BB	BT	11.30	13.30	12.17	13.04	116	73	47	120		90	60	60	120
	8	LENA	RD	AKR	14.20		14.52	15.26	50	32	34	66		40	30	50	80
	9	TANTO SENTOSA	RD	BB		17.10	16.13	16.46		71	33	104			75	45	120
	10	SINAR AMBON	RD	BT	18.15		18.46	19.23	65	31	37	68		45	30	40	70
	11	MILA UTAMA	JU	RD			19.34	19.46		11	12	23			5	35	40
	12	SPIL CITRA	BT	RD			20.15	21.14		29	59	88			10	75	85
	13	TELUK FLAMINGGO	BB	RD		22.15	21.40	22.04		37	24	61			40	35	75
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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL	QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes	minutes	minutes	minutes	minutes
Thursday, 19 October 2017	1	DONGHAI STAR	TL	RD	22.55		00.10	00.36	30	20	26	46	45	30	35	65
	2	TANTO HORAS	BT	RD			02.00	02.36		84	36	120		85	40	125
	3	KATOMAS	SMPR	RD		04.11	03.23	03.37		81	14	95		35	35	125
	4	TANTO HANDAL	MRH	RD	05.00	05.40	05.18	05.23	49	35	5	40		105	35	70
	5	TANTO STAR	RD	BB	06.28	08.00	07.19	07.51	48	70	32	102		30	15	140
	6	FATIMAH 3	RD	BT	08.33		08.57	09.39	33	24	43	67	35	80	50	45
	7	NORTHERN DEMOCRAT	RD	ICT			10.26	11.02		47	71	118		40	45	130
	8	STAR HIDRA	JU	RD		11.51	11.24	11.37		36	61	97		5	35	85
	9	MARINA STAR 2	RD	NT	12.20		12.43	13.24	29	23	41	64		55	40	40
	10	MUTIARA BENOA	RD	MRH		14.49	13.40	14.17		48	37	85		20	40	95
	11	MUTIARA PERSADA 3	RD	JU	15.10		15.21	15.50	21	11	29	40		50	40	60
	12	TANTO BERKAT	RD	BU		16.45	16.14	16.29		40	15	55		20	35	90
	13	MS HAWK	RD	KT	17.18	19.15	17.59	18.37	33	79	38	117		105	50	55
	14	NAVIGATOR GLOBAL	RD	AKR	19.45		20.22	21.04	30	37	42	79		30	60	155
	15	KAWA MAS	TL	RD			22.12	22.31		68	19	87	25	35	35	90
	16	KMTC CENNAI	TL	RD		23.30	22.44	23.00		43	16	59		15	35	70
TOTAL																

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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL	QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes	minutes	minutes	minutes	minutes
Friday, 20 October 2017	1	ARMADA SEJATI	BT	RD	03.44		03.59	04.35	254	15	37	52	180	30	70	100
	2	SWARNA BAHTERA	JU	RD		05.30	04.59	05.04		50	5	55		45	35	80
	3	LAGUN MAS	RD	ICT	07.40		08.13	08.50	130	33	37	70	100	30	40	70
	4	SENDANG MAS	TL	RD			09.11	10.01		21	50	71		10	60	70
	5	PALUNG MAS	RD	TL			10.37	10.47		36	10	46		10	35	45
	6	SELATAN DAMAI	RD	ICT		11.37	10.50	11.14		26	24	50		40	35	75
	7	WAN HAI 281	RD	ICT	12.49	14.28	13.29	13.57	72	71	28	99	50	30	50	80
	8	MERATUS KAMPAR	RD	NT	15.30		16.08	16.32	32	38	24	62		100	40	140
	9	NORTHERN DEMOCRATION	ICT	RD			16.53	17.25		23	32	55		20	40	60
	10	NIRBITA	SMP	RD		18.33	18.03	18.14		57	11	68		5	40	45
	11	SOPHIA	RD	MRH	18.53	20.18	19.20	19.58	20	47	38	85		65	40	105
	12	KIRAN ASYA	JU	RD	21.47	23.15	22.20	22.54	89	58	34	92		170	40	210
	13															
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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Saturday, 21 October 2017	1	NEW LIFE	RD	JU	23.30	01.16	23.57	00.43	15	60	46	106			60	50	110
	2	MUARA MAS	BT	RD	02.17		02.34	02.46	61	49	12	61		40	25	95	120
	3	RORO PRAYASTI	RD	MSP			04.04	04.50		31	46	77			10	50	60
	4	MERATUS DILI	TL	RD			05.34	06.06		69	32	101			30	40	70
	5	MERATUS PALEMBANG	NT	RD		07.30	06.57	07.15		19	18	37			70	40	110
	6	TANTO DAMAI	RD	MRH	09.00	10.00	09.24	09.48	90	36	24	60		60	25	35	60
	7	SINAR SABANG	RD	ICT	10.25		10.47	11.13	25	22	26	48			45	35	80
	8	NEW LIFE	JU	RD		12.12	11.29	11.48		40	19	59			10	35	45
	9	MERATUS KAMPAR	NT	RD	12.34	13.17	12.52	13.02	22	33	6	39			35	35	70
	10	KANAL MAS	BT	RD	14.50		15.05	15.16	93	15	11	26			30	35	65
	11	MERATUS KARIMATA	RD	BB			15.39	16.12		23	33	56			20	35	55
	12	PULAU NUNUKAN	RD	NT		16.55	16.22	16.45		20	23	43			10	35	45
	13	ISA WINTER	RD	JS	17.25	18.42	17.54	18.23	30	48	29	77			75	45	120
	14									47		47					
	15									37		37					
	16									10		10					
	17																
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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Sunday, 22 October	1	RELIANCE	RD	MRH	23.48	01.04	00.11	00.44		43	33	76		270	30	45	75
	2	SOPHIA	MRH	RD	01.34	02.24	01.55	02.04	30	41	9	50			75	40	115
	3	ARMADA PURNAMA	RD	BU	03.50	05.11	04.21	04.56	86	46	35	81		50	30	60	90
	4	SPIL HAYU	BT	RD	05.50		06.00	06.10	39	10	10	20			35	35	70
	5	MERATUS KENDARI	RD	NT		07.24	06.40	07.08		46	28	74			20	40	60
	6	SIN HUAT HUAT 1	RD	NT	08.00	09.28	08.34	09.18	36	44	44	88			95	60	155
	7	MERATUS MEDAN 1	RD	BT	12.20	14.06	13.00	13.43	172	63	43	106		175	60	40	100
	8	TANTO SENTOSA	RD	BT	15.12		15.58	16.39	66	46	41	87		70	30	40	70
	9	KANAL MAS	RD	ICT		18.13	17.11	17.44		61	33	94			75	35	110
	10	TANTO HARMONI	RD	BB	19.18		19.47	20.16	65	29	29	58		50	30	30	60
	11	IRIS MANDIRI	TL	RD		22.07	21.08	21.41		49	33	82			85	45	130
	12																
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DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Monday, 23 October 2017	1	ST AYLON	RD	ICT	00.11	01.54	00.45	01.24	124	64	39	103		110	60	40	100
	2	DARMA KARTIKA 9	RD	JU	02.43	03.55	03.06	03.31	49	47	25	72		30	60	40	100
	3	MERATUS KENDARI 1	NT	RD	06.05	07.02	06.22	06.43	130	36	21	57		90	65	35	100
	4	TANTO SENANG	RD	BU	10.33	11.55	11.01	11.35	211	48	34	82		190	30	45	75
	5	COUGAR	ICT	RD	12.27	13.22	12.44	13.01	32	38	17	55			55	35	90
	6	SAWU SEA	RD	TL	14.02		14.37	15.18	40	65	41	106			60	60	120
	7	KANAL MAS	ICT	RD			16.16	16.28		29	12	41			55	35	90
	8	TRANS PASIFIK 06	RD	NT			17.24	18.20		18	56	74			75	60	135
	9	PEDHOULAS FARMER	JU	RD		19.26	18.50	18.57		59	7	66		80	65	45	110
	10																
	11																
	12																
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	17																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Tuesday, 24 October 2017	1	TANTO SENTOSA	BT	RD	01.50		02.20	02.54	324	30	34	64		200	30	40	70
	2	SINAR PAPUA	NT	RD		03.55	03.12	03.38		35	26	61			50	35	85
	3	DHAMA KARTIKA IX	JU	RD	04.32		04.57	05.08	37	25	11	36			35	35	70
	4	ANTHOS	RD	BGSR		06.58	05.30	06.41		39	71	110			35	70	105
	5	DARYA LOK	RD	TL	07.24		07.58	09.20	26	58	22	80			115	85	200
	6	MERATUS PALEMBANG	NT	RD			10.11	11.37	7	53	26	79		70	30	35	65
	7	SPIL CAYA	BT	RD			13.06	13.40	29	11	34	45			80	45	125
	8	SERASI 2	MRH	RD			15.43	16.10		123	27	150		40	30	40	70
	9	TELUK BERAU	RD	BU			17.17	17.44	29	78	27	105			55	40	95
	10	TANTO TERANG	RD	BB		19.00	18.22	18.47		51	25	76			30	40	70
	11	MERATUS ULTIMA	BB	RD	19.23		19.49	19.58	23	26	9	35			50	35	85
	12	MSC IMMA	RD	ICT			21.38	22.29		100	51	151			30	50	80
	13	ORIENTAL GALAXY	RD	BT			22.37	23.19		8	42	50			30	50	80
	14	MENTARI SEMANGAT	RD	BB		00.10	23.47	00.10		28	23	51			40	40	80
	15																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Wednesday, 25 October 2017	1	MERATUS MEDAN 1	BT	RD	00.10		00.21	00.44		11	23	34			25	35	60
	2	STAR OF LUCK	ICT	RD			01.13	01.34		29	21	50			15	35	50
	3	MERATUS BONTANG	TL	RD			01.55	02.38		21	43	64			30	35	65
	4	SITU MAS	RD	TL		04.08	02.47	03.25		52	38	90			5	30	35
	5	CAPE MORETON	RD	TL	04.23		05.05	05.29	15	42	24	66			130	45	175
	6	DOROLONDA	JU	RD			07.20	07.36		51	16	67		45	25	35	60
	7	WARNOW CHIEF	RD	ICT			09.04	09.28		78	24	102			60	45	105
	8	MERATUS GORONTALO	BB	RD		10.54	09.54	10.22		58	28	86			45	40	85
	9	TAL STAR	RD	MRH	11.40		12.17	12.41	46	37	24	61		20	75	35	110
	10	TRANS PASIFIK 06	NL	RD		14.43	14.16	14.24		114	8	122			40	35	75
	11	MENTARI SEMANGAT	BB	RD	15.35	16.33	15.57	16.18	52	37	21	58			105	50	155
	12	INTAN DAYA 11	RD	TL	17.41		18.26	18.56	68	45	30	75		20	35	45	80
	13	MENTARI SUKSES	RD	BB			19.43	20.11		47	28	75			40	60	100
	14	TANTO CERIA	RD	BB			21.04.	21.30		53	26	79			20	55	75
	15	MERATUS AMBON	BB	RD		22.29	22.04	22.19		44	15	59			40	35	75
	16																
	17																
TOTAL																	

					AIS WORKING HOUR									DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Thursday, 26 October 2017	1	KAMILA	RD	NT	00.50		01.35	02.24	141	45	49	94		130	30	60	90
	2	SPIL NINGSIH	RD	BT			02.50	03.15		26	25	51			15	45	60
	3	WARNOW CHIEF	ICT	RD		05.00	03.50	04.35		60	25	85			15	60	75
	4	EAST GATE	JU	RD	06.27		06.48	07.08	87	21	20	41		55	30	35	65
	5	CAPE MORETON	TL	RD			07.46	08.18		38	32	70			25	35	60
	6	EVER ALLY	ICT	RD		09.40	08.33	09.15		40	42	82			40	45	85
	7	WHITE MIYAGI	RD	JB	10.40	11.41	11.05	11.24	60	42	19	61		35	60	40	100
	8	SINAR JEPARA	RD	BB	13.16	14.31	13.50	14.16	95	49	26	75		80	30	35	65
	9	PONA	ICT	RD	14.55	16.37	15.25	15.47	24	40	22	62			90	35	125
	10	PRATIWI RAYA	RD	TL	17.40	19.07	18.05	18.23	63	69	18	87		30	95	45	140
	11	KABONGA BARU 2	BT	RD	20.42		21.06	21.20	95	24	14	38		55	30	35	65
	12	ORIENTAL GALAXY	BT	RD			21.28	22.01		8	32	40			5	40	45
	13	PALUNG MAS	RD	TL			22.20	22.47		19	27	46			10	35	45
	14	LOUDS ISLAND	RD	ICT		00.00	23.18	00.00		31	42	73			50	50	100
	15																
TOTAL																	

					AIS WORKING HOUR								DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Friday, 27 October 2017	1	MENTARI SENTOSA	RD	BB	00.00	01.00	00.19	00.56		23	37	60			30	45	75
	2	MENTARI PRATAMA	RD	BT	01.22		01.55	02.18	22	33	23	56			45	45	90
	3	OCEAN BRIDGE	RD	TL		04.25	03.09	03.54		31	45	76			80	60	140
	4	LUMOSO SELAMAT	RD	MRH	05.10		05.43	06.15	45	33	32	65		25	30	40	70
	5	VALERIE SCHULTE	ICT	RD			06.59	07.12		44	13	57			20	35	55
	6	HOSANA 7	NT	RD			07.25	07.35		13	10	23			5	35	40
	7	PRATAMA 7	RD	NT		08.39	07.48	08.23		29	35	64			10	40	50
	8	LEGUNDI	RD	JU	09.00	10.10	09.21	09.37	21	54	16	70			50	35	85
	9	HAI PHUONG SKY	RD	JB	11.10	12.27	11.48	12.12	60	53	24	77		55	60	35	95
	10	SINAR JEPARA	BB	RD	14.29	15.25	14.47	15.08	112	25	21	46		85	60	35	95
	11	MERATUS ULTIMA 2	RD	BB	16.38		17.09	17.47	73	31	38	69		45	30	45	75
	12	MSC GIANNA	RD	ICT			18.20	18.58	27	33	38	71			15	60	75
	13	MARINA STAR	RD	BB			20.00	20.48	36	11	48	59			80	40	120
	14	SINAR SUMBA	RD	ICT			21.54	22.20		20	26	46			50	40	90
	15	MERATUS ULTIMA 1	RD	JS		23.50	22.49	23.44		35	55	90			60	50	110
	16																
	17																
TOTAL																	

					AIS WORKING HOUR								DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL		QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes		minutes	minutes	minutes	minutes
Saturday, 28 October 2017	1	LOUDS ISLAND	ICT	RD	03.23		03.52	04.26	213	29	34	63		140	30	40	70
	2	TELUK FLAMINGGO	RD	BT		05.24	04.39	05.10		27	31	58			75	45	120
	3	SUNGAI MAS	TL	RD	06.39	08.32	07.15	08.03	75	65	18	83		50	35	60	95
	4	KOTA JUTA	RD	ICT	09.00		09.29	09.55	22	44	26	70			70	35	105
	5	SANTIKA NUSANTARA	JU	RD			10.39	11.00	6	22	21	43			20	20	40
	6	HONGKONG BRIDGE	RD	TL			11.38	12.20		38	42	80			20	60	80
	7	SURPLUS	JS	RD		13.28	12.50	13.10		48	20	68			25	35	60
	8	MSC GIANNA	ICT	RD	13.37	15.00	13.53	14.35	19	41	42	83			60	50	110
	9	SINAR SABANG	RD	ICT	16.16	19.00	16.58	17.31	76	57	33	90		130	65	45	110
	10	TANTO EXPRESS	RD	BB	20.10		20.37	21.18	70	27	41	68		50	40	40	80
	11	MAGELAN	TL	RD			21.57	22.21		49	24	73			20	40	60
	12	OCEAN BRIDGE	TL	RD		23.17	22.41	22.51		46	10	56			85	45	130
	13																
	14																
	15																
TOTAL																	

					AIS WORKING HOUR										DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL			QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes			minutes	minutes	minutes	minutes
Monday, 29 October 2017	1	CUCKOO HUNTER	RD	ICT	23.45		23.59	00.33	28	14	34	48				20	40	60
	2	ARMADA PURNAMA	RD	BT		02.33	01.26	02.07		79	41	120				20	40	60
	3	PULAU NUNUKAN	NT	RD	02.55	03.53	03.11	03.31	22	38	20	58				60	40	100
	4	TB. CUMAWUS	JS	RD	05.49	06.44	06.03	06.27	116	31	24	55				130	40	170
	5	ORIENTAL DIAMOND	NT	RD	07.19	08.33	07.44	08.15	108	43	31	74				60	55	115
	6	MERATUS KAMPAR	RD	JS	10.26		10.39	10.55	14	28	16	44			60	40	100	140
	7	SLAMET 6	RD	BT			11.36	12.14		12	38	50				25	35	60
	8	SINAR AMBON	BB	RD			12.43	13.12		29	29	58				40	35	75
	9	MARINA STAR 1	ICT	RD			13.38	14.16		26	38	64				5	40	45
	10	KOTA JUTA	TL	RD			14.41	15.11		25	30	55				10	35	45
	11	HONGKONG BRIDGE	TL	RD			15.30	15.50		19	20	39				5	35	40
	12	TANTO SEMANGAT	RD	ICT			16.04	16.20		14	16	30				15	40	55
	13	URU BHUM	AKR	RD		17.38	16.49	17.18	139	49	29	78				75	35	110
	14	NAVIGATOR GLOBAL	RD	BT	19.57		20.30	20.52		33	22	55			140	25	35	60
	15	MITRA KENDARI	RD	ICT			21.02	21.44		10	42	52				20	45	65
	16	LAGUN MAS	MRH	RD			22.19	22.40		35	21	56				15	45	60
	17	LUMOSO SELAMAT				23.49	23.09	23.17		61	8	69				55	40	95
TOTAL																		

					AIS WORKING HOUR										DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL			QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes			minutes	minutes	minutes	minutes
Sunday, 30 October 2017	1	FELYA	JS	MRH	00.11		00.30	01.21	22	19	51	70				30	70	100
	2	CHUKO HUNTER	ICT	RD		03.22	01.50	02.53		62	63	125				60	50	110
	3	SINAR AMBON	BT	RD	05.23		05.46	06.22	121	23	36	59			100	30	40	70
	4	NOTHERN DEFENDER	RD	ICT		08.12	06.58	07.41		67	43	110				30	70	100
	5	DUTA KAPUAS	RD	NT	08.59	10.10	09.10	09.48	47	10	38	48				90	60	150
	6	ISA EXPRESS	JU	RD	12.42	13.35	13.00	13.17	152	36	17	53			120	30	35	65
	7	ARMADA PERMATA	RD	TL	14.00	15.44	14.39	15.12	25	71	33	104				55	45	100
	8	SPIL CAYA	RD	BT	16.17		16.51	17.44	33	34	53	87				90	60	150
	9	MENTARI PRAKARSA	RD	JS			18.00	18.43		28	43	71				15	50	65
	10	MUTIARA FERINDO	RD	JU		21.18	19.25	19.47	12	21	22	43				50	40	90
	11	TIGA RODA	NT	RD	22.08	23.08	22.23	22.51	51	32	28	60			100	65	35	100
	12																	
	13																	
	14																	
TOTAL																		

					AIS WORKING HOUR										DAILY REPORT WORKING HOUR			
DATE	NO	SHIP NAME	LOCATION		OP TIME		SERVICE TIME			TRANSIT	SERVICE	TOTAL			QUAY	TRANSIT	SERVICE	TOTAL
			FROM	TO	START	END	START	END		minutes	minutes	minutes			minutes	minutes	minutes	minutes
Tuesday, 31 October 2017	1	AS CONSTANTINA	RD	ICT	23.23		23.49	00.28	15	26	39	65				30	45	75
	2	DARWIN	RD	TL			00.51	01.29		23	38	61				30	60	90
	3	RORO SAWITRI	JS	RD		02.47	02.19	02.29		68	10	78				45	35	80
	4	DA CHENG	JU	RD	04.34		04.54	05.14	107	35	20	55			50	30	35	65
	5	AS SAVONIA	RD	ICT			06.09	06.42	18	27	33	60				35	45	80
	6	MERATUS SABANG	ICT	RD			07.06	07.14		24	8	32				15	35	40
	7	HIJAU JELITA	RD	NT			07.25	08.53		11	28	39				5	90	105
	8	ORIENTAL MUTIARA	RD	BB		10.18	09.27	09.56		56	29	85				15	45	105
	9	NORTHERN DEFENDER	ICT	RD	11.59	13.28	12.24	13.01	101	52	37	89			80	60	40	105
	10	MUTIARA FERINDO 1	RD	JU	16.46	18.17	17.27	17.54	198	64	27	91			200	65	35	65
	11	MENTARI TRADER	RD	JS	19.39	20.47	20.01	20.29	82	40	28	68			60	30	35	90
	12	MERATUS GORONTALO	BB	RD	21.16		21.42	22.09	29	26	27	53				55	40	85
	13	AS CONSTANTINA	ICT	RD			23.04	23.29		55	25	80				45	35	80
	14	AS SAVONIA	ICT	RD		00.33	23.37	00.18		23	41	64				40	50	90
	15																	
	16																	
	17																	
TOTAL																		

ATTACHMENT 1
FUEL ESTIMATION (AIS WORKING HOUR)
KT. KRESNA 315

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			L	L	L						
Sunday, 01 October 2017	1	TANTO FAJAR 1	9.69	9.66	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.53315	0.0	15.5	15.5						
	2	TANTO SEMANGAT	18.11	24.10	12.21338	12.37552	3.87156	3.96821	7.652145	7.735191	9.623653	9.66442	67.1040758	78.945971	9.7	11.5	21.3						
	3	MERATUS MALINO	16.99	21.95	7.633363	7.734698	2.419725	2.480132	4.423425	4.476621	5.525012	5.552254	40.245229	47.347328	0.0	7.2	7.2						
	4	AWLI	16.32	20.71	15.26673	15.4694	4.83945	4.960263	8.428742	8.53664	10.47988	10.53641	78.5175068	92.373537	16.0	14.4	30.4						
	5	MENTAYA RIVER	10.41	10.74	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.841905	64.519888	2.7	9.3	12.0						
	6	RED ROCK	9.45	9.32	12.86767	13.03849	4.078965	4.180793	8.317422	8.403998	10.4874	10.5291	71.903831	84.592742	0.0	12.2	12.2						
	7	SINAR BELAWAN	15.96	20.04	8.287651	8.397672	2.62713	2.692714	4.45403	4.513041	5.523295	5.554582	42.0501159	49.470725	0.0	7.8	7.8						
	8	KOTA JUTA	26.40	41.79	9.596228	9.72362	3.04194	3.11788	9.741174	9.793007	12.64613	12.65987	70.3198504	82.729236	0.0	9.1	9.1						
	9	SPIL NIKEN	26.46	41.93	22.4639	22.76211	7.120905	7.298673	22.86952	22.99061	29.69388	29.7257	164.925292	194.02976	0.0	21.2	21.2						
	10	SPIL NITA	26.41	41.81	18.75626	19.00526	5.94561	6.094037	19.04522	19.14651	24.72516	24.75198	137.470041	161.72946	7.0	17.7	24.7						
	11	PAN DAISY	30.28	51.05	10.9048	11.04957	3.45675	3.543045	13.28715	13.33807	17.39465	17.39938	90.3734266	106.32168	4.3	10.3	14.6						
	12	SEASPAN FRASER	38.72	73.12	15.70292	15.91138	4.97772	5.101985	26.7429	26.78885	35.42476	35.39423	166.044736	195.34675	5.5	14.8	20.4						
	13	UNI FORTUNA	30.96	52.74	6.542883	6.629741	2.07405	2.125827	8.214253	8.243936	10.76674	10.76839	55.3658219	65.136261	0.0	6.2	6.2						
																		TOTAL (kg)	TOTAL (L)	LOH (L)	MARGIN	%	
TOTAL													1130.56501	1330.0765			202.4975	1302.687868	1532.57396	2370	837.426	35.33443	

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Monday, 02 October 2017	1	KANG MAY	43.62	87.02	19.62865	19.88922	6.22215	6.377481	39.41814	39.45402	52.44847	52.38091	235.819028	277.43415	0	18.5475	18.5475						
	2	GUENTHER SCHUTLE	54.08	119.14	17.44769	17.67931	5.5308	5.668872	36.18179	36.20957	48.1801	48.11444	215.01256	252.95595	4.533833	16.48667	21.0205						
	3	STRAIT MAS	20.84	29.59	17.44769	17.67931	5.5308	5.668872	13.03787	13.14892	16.62021	16.66811	105.801778	124.47268	0	16.48667	16.48667						
	4	PULAU HOKI	16.63	21.28	14.39434	14.58543	4.56291	4.676819	8.12861	8.229689	10.12854	10.18095	74.8872947	88.1027	2.555433	13.6015	16.15693						
	5	PALU SIPAT	22.96	34.08	12.86767	13.03849	4.078965	4.180793	10.88449	10.96183	13.98795	14.01705	84.0172326	98.843803	7.501433	12.15892	19.66035						
	6	MERATUS GORONTALO	24.79	38.12	16.13911	16.35336	5.11599	5.243707	15.08043	15.17229	19.49243	19.52192	112.119248	131.905	0	15.25017	15.25017						
	7	DUTA KAPUAS 17	3.22	1.94	32.06012	32.48573	10.16285	10.41655	20.72307	20.93878	26.12962	26.23351	179.150223	210.76497	0	30.29425	30.29425						
	8	MITRA SEJAHTERA IX	11.23	11.99	19.41055	19.66823	6.153015	6.30662	12.54662	12.67722	15.81997	15.88287	108.465101	127.606	0	18.34142	18.34142						
	9	MERATUS GORONTALO	24.79	38.12	15.04863	15.2484	4.770315	4.889402	14.06149	14.14714	18.17537	18.20287	104.543623	122.9925	13.6015	14.21975	27.82125						
	10	TIGA RODA	14.30	17.07	18.75626	19.00526	5.94561	6.094037	8.857145	8.995095	10.83232	10.90913	89.3948612	105.17042	0	17.72317	17.72317						
	11	INTAN DAYA 4	22.84	33.83	27.6982	28.0659	8.780145	8.999334	23.27166	23.4387	29.89465	29.95806	180.106658	211.89019	0	26.17258	26.17258						
	12																						
	13																						
	14																						
	15																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													1489.31761	1752.1384			227.4748	1682.671173	1979.61314	2160	180.3869	8.351243	

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Tuesday, 03 October 2017	1	OLYMPIA	42.42	83.56	21.80961	22.09914	6.9135	7.08609	42.14431	42.19012	56.02113	55.95419	254.218084	299.0801	18.38263	20.60833	38.99097						
	2	KOTA NABIL	44.63	89.98	15.92101	16.13237	5.046855	5.172846	33.00744	33.03282	43.95283	43.89296	196.159123	230.77544	7.089267	15.04408	22.13335						
	3	TANTO LUAS	15.65	19.46	15.04863	15.2484	4.770315	4.889402	7.897787	8.00562	9.77033	9.828073	75.4585611	88.774778	0	14.21975	14.21975						
	4	CJN 2	29.87	50.05	18.10197	18.34228	5.738205	5.881455	21.65999	21.74595	28.3342	28.34399	148.148058	174.29183	0	17.10492	17.10492						
	5	FREIGH EXPRESS 1	21.04	29.99	23.11818	23.42508	7.32831	7.511255	17.47775	17.62418	22.29802	22.3605	141.14329	166.05093	0	21.84483	21.84483						
	6	MENTARI PRATAMA	15.74	19.64	10.25052	10.38659	3.249345	3.330462	5.418726	5.492037	6.708436	6.747576	51.5836932	60.686698	8.573067	9.685917	18.25898						
	7	STAR OF LUCK	39.00	73.89	26.17153	26.51896	8.2962	8.503308	45.01268	45.08767	59.64287	59.58982	278.823045	328.02711	0	24.73	24.73						
	8	MERATUS PALEMBANG	18.01	23.91	14.61244	14.80642	4.632045	4.74768	9.096672	9.196242	11.43414	11.4832	80.0088434	94.128051	2.555433	13.80758	16.36302						
	9	SINAR AMBON	12.12	13.41	11.55909	11.71254	3.664155	3.755628	7.471582	7.549354	9.420883	9.45834	64.591577	75.990091	0	10.92242	10.92242						
	10	ISA EXPRESS	56.48	126.93	16.5753	16.79534	5.25426	5.385428	34.3727	34.39909	45.7711	45.70872	204.261932	240.30816	0	15.66233	15.66233						
	11	PAC SCHEDAR	51.25	110.13	22.4639	22.76211	7.120905	7.298673	46.58405	46.61982	62.03188	61.94734	276.828671	325.68079	0	21.22658	21.22658						
	12	MERATUS BONTANG	12.46	13.95	13.30386	13.48047	4.217235	4.322515	8.599368	8.68888	10.8429	10.88601	74.341249	87.460293	0	12.57108	12.57108						
	13	SENDANG MAS	56.09	125.66	29.00678	29.39185	9.194955	9.4245	60.15222	60.1984	80.09942	79.99026	357.458381	420.53927	0	27.40908	27.40908						
	14																						
	15																						
	16				11.4	16.72																	
	17																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													2203.02451	2591.7935			261.4373	2425.246225	2853.23085	2320	-533.231	-22.9841	
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Wednesday, 04 October 2017	1	URU BHUM	79.87	210.56	15.92101	16.13237	5.046855	5.172846	33.01588	33.04123	43.96434	43.90443	196.198961	230.82231	3.7095	15.04408	18.75358						
	2	MERATUS BANJAR 1	26.80	42.71	30.96964	31.38077	9.81717	10.06225	32.06251	32.22754	41.66492	41.70617	229.890984	270.45998	0	29.26383	29.26383						
	3	PULAU HOKI	34.08	60.68	9.596228	9.72362	3.04194	3.11788	13.72244	13.75995	18.07514	18.06934	89.1065319	104.83121	15.49747	9.067667	24.56513						
	4	TANTO TERANG	45.98	93.98	19.19246	19.44724	6.08388	6.235759	39.79997	39.83052	52.99811	52.92588	236.513816	278.25155	0	18.13533	18.13533						
	5	PALUNG MAS	19.83	27.51	10.9048	11.04957	3.45675	3.543045	7.650897	7.7221	9.708853	9.741236	63.7772529	75.032062	0	10.30417	10.30417						
	6	ARMADA PERMATA	36.64	67.47	5.670498	5.745776	1.79751	1.842383	8.953309	8.972433	11.83248	11.82491	56.6392978	66.634468	0	5.358167	5.358167						
	7	ARMADA SERASI	23.44	35.14	19.62865	19.88922	6.22215	6.377481	17.05648	17.17283	21.9553	21.99747	130.299592	153.29364	0	18.5475	18.5475						
	8	DUTA KAPUAS	6.73	5.68	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.70202	0	16.48667	16.48667						
	9	SPRING MAS	60.43	140.10	20.71913	20.99418	6.567825	6.731786	42.96587	42.99886	57.21387	57.1359	255.327415	300.38519	0	19.57792	19.57792						
	10	MERATUS KARIANGAU	23.73	35.77	17.22959	17.45832	5.461665	5.598011	15.21135	15.31262	19.59854	19.63438	115.504473	135.88762	0	16.28058	16.28058						
	11	EVER ALLY	52.87	115.24	14.39434	14.58543	4.56291	4.676819	29.84997	29.87289	39.74858	39.69441	177.385362	208.68866	6.594667	13.6015	20.19617						
	12	NAVIGATOR ARIES	57.23	129.41	21.15532	21.43616	6.706095	6.873507	43.87042	43.9041	58.41837	58.33876	260.702729	306.70909	0	19.99008	19.99008						
	13	DRAGON LUCKY	40.32	77.59	6.542883	6.629741	2.07405	2.125827	11.78539	11.80222	15.63647	15.62059	72.2171699	84.961376	0	6.1825	6.1825						
	14	URU BHUM	92.56	261.15	17.22959	17.45832	5.461665	5.598011	35.72951	35.75695	47.57785	47.51301	212.324903	249.794	0	16.28058	16.28058						
	15	SPRING MAS	60.43	140.10	25.73534	26.07698	8.15793	8.361586	53.36814	53.40911	71.06565	70.9688	317.143526	373.11003	0	24.31783	24.31783						
																		TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													2510.52873	2953.5632			264.2401	2735.132776	3217.80327	2300	-917.803	-39.9045	

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Thursday, 05 October 2017	1	GRIYA AMBON	40.53	78.17	12.21338	12.37552	3.87156	3.96821	22.15568	22.18654	29.40121	29.37081	135.542906	159.46224	7.419	11.54067	18.95967						
	2	LEO PERDANA	64.08	152.63	27.04391	27.40293	8.57274	8.786752	56.08177	56.12483	74.67916	74.57738	333.269468	392.08173	0	25.55433	25.55433						
	3	PALUNG MAS	19.38	26.61	17.01149	17.23733	5.39253	5.52715	11.59824	11.71053	14.68604	14.73822	97.9015249	115.17826	7.419	16.0745	23.4935						
	4	MERATUS BORNEO	15.41	19.03	5.234306	5.303793	1.65924	1.700662	3.383358	3.418576	4.26606	4.283022	29.249016	34.410607	1.4838	4.946	6.4298						
	5	GAMALISE	32.68	57.07	10.46861	10.60759	3.31848	3.401323	14.13848	14.18239	18.58453	18.58228	93.2836907	109.74552	0	9.892	9.892						
	6	FREIGH EXPRESS	28.70	47.21	7.851459	7.955689	2.48886	2.550992	8.904679	8.943725	11.62133	11.62798	61.9447138	72.876134	0	7.419	7.419						
	7	TANTO HARMONI	39.19	74.43	6.542883	6.629741	2.07405	2.125827	11.3308	11.34927	15.01658	15.00293	70.0720757	82.437736	0	6.1825	6.1825						
	8	KANG MAY	61.33	143.17	6.10669	6.187758	1.93578	1.984105	12.66363	12.67335	16.86304	16.84005	75.254396	88.534584	0	5.770333	5.770333						
	9	MENTAYA RIVER	21.88	31.77	7.851459	7.955689	2.48886	2.550992	6.242692	6.291317	7.991347	8.01106	49.3834169	58.098138	0	7.419	7.419						
	10	CSCL KINGSTON	63.38	150.20	17.01149	17.23733	5.39253	5.52715	35.27724	35.30433	46.9756	46.91158	209.637246	246.63205	0	16.0745	16.0745						
	11	MERATUS TANGGUH 1	33.10	58.16	15.26673	15.4694	4.83945	4.960263	20.98619	21.0489	27.60367	27.59858	137.773171	162.08608	0	14.42583	14.42583						
	12	EVER ALLY	43.06	85.40	14.17625	14.36444	4.493775	4.605959	27.96446	27.99219	37.19191	37.1456	167.934578	197.57009	7.831167	13.39542	21.22658						
	13	SURYA PEKIK	40.66	78.53	18.53817	18.78427	5.876475	6.023177	33.77307	33.81939	44.82307	44.77623	206.413852	242.83983	0	17.51708	17.51708						
	14	YOU SHEN 3	57.32	129.68	21.80961	22.09914	6.9135	7.08609	45.22723	45.26196	60.22513	60.14305	268.7657	316.19494	10.71633	20.60833	31.32467						
	15	TANTO TENANG	34.65	62.18	16.13911	16.35336	5.11599	5.243707	23.6088	23.66998	31.12203	31.10967	152.362646	179.25017	4.121667	15.25017	19.37183						
	16	ARMADA SERASI	18.98	25.81	19.19246	19.44724	6.08388	6.235759	12.74895	12.87685	16.11036	16.17087	108.866368	128.07808	0	18.13533	18.13533						
	17																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													2197.65477	2585.4762			249.196	2409.471342	2834.67217	2270	-564.672	-24.8754	

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Friday, 06 October 2017	1	TELUK BERAU	21.31	30.55	12.43148	12.59651	3.940695	4.039071	9.551863	9.630049	12.19969	12.23254	76.6218963	90.143407	7.006833	11.74675	18.75358						
	2	ORIENTAL EMERALD	36.64	67.46	16.13911	16.35336	5.11599	5.243707	25.48148	25.53592	33.67568	33.65413	161.199374	189.64632	2.7203	15.25017	17.97047						
	3	TANTO HANDAL	17.55	23.02	13.30386	13.48047	4.217235	4.322515	8.022057	8.113646	10.05566	10.1016	71.6170507	84.255354	4.039233	12.57108	16.61032						
	4	MERATUS DILI	31.27	53.52	20.50103	20.77319	6.49869	6.660925	26.08978	26.18152	34.2155	34.21894	175.139586	206.04657	0	19.37183	19.37183						
	5	KUWIANG	34.42	61.57	20.28294	20.5522	6.429555	6.590064	29.39685	29.47472	38.73963	38.72544	190.191399	223.75459	0	19.16575	19.16575						
	6	SERASI 1	21.49	30.93	8.287651	8.397672	2.62713	2.692714	6.436703	6.488579	8.22694	8.248498	51.4058882	60.477516	0	7.831167	7.831167						
	7	SPIL CAYA	84.43	228.33	11.1229	11.27056	3.525885	3.613906	23.06589	23.0836	30.71481	30.67296	137.070507	161.25942	0	10.51025	10.51025						
	8	TANTO SUBUR 2	22.12	32.28	8.941939	9.060646	2.834535	2.905297	7.208615	7.263637	9.236096	9.258062	56.7088269	66.716267	0	8.449417	8.449417						
	9	CSCL COSCO SAOPAULO	112.51	347.31	28.13439	28.50789	8.918415	9.141056	58.34313	58.38792	77.69041	77.58453	346.707753	407.89147	0	26.58475	26.58475						
	10	ORIENTAL GOLD	35.43	64.22	22.4639	22.76211	7.120905	7.298673	33.86576	33.94729	44.68875	44.66662	216.814011	255.07531	0	21.22658	21.22658						
	11	SPIL CITRA	73.93	188.10	16.7934	17.01634	5.323395	5.456289	34.82497	34.85171	46.37335	46.31015	206.949589	243.4701	4.533833	15.86842	20.40225						
	12	PRATAMA 1	3.86	2.52	24.20867	24.53004	7.673985	7.86556	15.64803	15.81091	19.73053	19.80898	135.276699	159.14906	0	22.87525	22.87525						
	13	MAHKOTA NUSANTARA	31.63	54.42	14.61244	14.80642	4.632045	4.74768	18.88474	18.94909	24.78151	24.78255	126.196477	148.46644	4.368967	13.80758	18.17655						
	14	LINTAS BATANGHARI	32.99	57.86	17.01149	17.23733	5.39253	5.52715	23.2724	23.34268	30.60536	30.60025	152.989184	179.98728	0	16.0745	16.0745						
	15	OOCL NORFOLK	114.02	354.15	19.62865	19.88922	6.22215	6.377481	40.70451	40.73576	54.20261	54.12875	241.88913	284.57545	2.060833	18.5475	20.60833						
																		TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													2104.88824	2476.3391			244.0027	2312.290507	2720.34177	2508	-212.342	-8.46658	

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR		
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Saturday, 07 October 2017	1	HANSA SIEGBRUG	56.61	127.37	21.59151	21.87815	6.844365	7.015229	44.77496	44.80934	59.62287	59.54162	266.078043	313.03299	0	20.40225	20.40225
	2	MAHKOTA NUSANTARA	31.48	54.04	13.95815	14.14345	4.42464	4.535098	17.92366	17.98555	23.5144	23.51595	120.000895	141.17752	2.2257	13.18933	15.41503
	3	TANTO BERKAT	32.08	55.56	16.7934	17.01634	5.323395	5.456289	22.12474	22.19718	29.05485	29.05397	147.020168	172.9649	7.006833	15.86842	22.87525
	4	BBC NEW YORK	41.56	81.09	13.74005	13.92246	4.355505	4.464237	28.49316	28.51503	37.94183	37.89012	169.322391	199.20281	3.132467	12.98325	16.11572
	5	SPIL HANA	21.18	30.28	9.596228	9.72362	3.04194	3.11788	7.316198	7.376757	9.339349	9.364983	58.8769548	69.267006	0	9.067667	9.067667
	6	MSC GIANNA	76.15	196.38	14.17625	14.36444	4.493775	4.605959	29.3977	29.42027	39.14633	39.09298	174.697705	205.52671	0	13.39542	13.39542
	7	CSCL COSCO SAOPAULO	111.97	344.89	6.10669	6.187758	1.93578	1.984105	12.66363	12.67335	16.86304	16.84005	75.254396	88.534584	0	5.770333	5.770333
	8	NBP PERDANA	5.49	4.22	8.505747	8.618663	2.696265	2.763575	5.497957	5.555185	6.932348	6.959911	47.529651	55.917236	0	8.03725	8.03725
	9	NORTHERN VOLITION	83.70	225.48	9.814324	9.944612	3.111075	3.188741	20.35226	20.36788	27.10131	27.06437	120.944565	142.28772	0	9.27375	9.27375
	10	TANTO SENANG	25.28	39.23	5.234306	5.303793	1.65924	1.700662	5.019501	5.048831	6.497164	6.506097	36.9695931	43.493639	0	4.946	4.946
	11	KOTA JAYA	73.98	188.25	32.06012	32.48573	10.16285	10.41655	66.48403	66.53508	88.53093	88.41028	395.085579	464.80656	0	30.29425	30.29425
	12	SPIL NIKEN	61.22	142.79	21.80961	22.09914	6.9135	7.08609	45.22723	45.26196	60.22513	60.14305	268.7657	316.19494	2.060833	20.60833	22.66917
	13	MERATUS KALABAHI	31.75	54.73	21.80961	22.09914	6.9135	7.08609	28.3355	28.431	37.19094	37.19175	189.057526	222.42062	8.243333	20.60833	28.85167
	14	SIREMAX	32.21	55.88	12.21338	12.37552	3.87156	3.96821	16.17681	16.22918	21.24819	21.24713	107.329981	126.27057	9.067667	11.54067	20.60833
	15	PRITHA	27.57	44.53	17.44769	17.67931	5.5308	5.668872	18.75988	18.85035	24.42295	24.44278	132.802629	156.23839	0	16.48667	16.48667
	16																
	17																

	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL	2517.313215	2961.54496	2318	-643.545	-27.7629

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR		
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Sunday, 08 October 2017	1	MUTIARA BARITO	21.20	30.34	19.62865	19.88922	6.22215	6.377481	14.98956	15.11335	19.13678	19.18909	120.54628	141.81915	3.627067	18.5475	22.17457
	2	MEDELIN EXPO	41.88	82.00	12.43148	12.59651	3.940695	4.039071	25.77952	25.79932	34.32832	34.28154	153.196449	180.23112	7.419	11.74675	19.16575
	3	MUTIARA FERINDO 1	32.39	56.35	25.08105	25.41401	7.950525	8.149004	33.47916	33.58578	43.98777	43.98432	221.631627	260.74309	0	23.69958	23.69958
	4	SPIL HANA	19.20	26.24	25.73534	26.07698	8.15793	8.361586	17.33795	17.50857	21.93358	22.01352	147.125457	173.08877	0	24.31783	24.31783
	5	ORIENTAL EMERALD	32.96	57.80	16.7934	17.01634	5.323395	5.456289	22.95012	23.01959	30.18038	30.17545	150.914955	177.54701	3.297333	15.86842	19.16575
	6	RED ROVER	11.60	12.58	15.48482	15.69039	4.908585	5.031124	10.0091	10.11329	12.62043	12.67061	86.528339	101.79805	4.368967	14.63192	19.00088
	7	NORTHERN VOLITION	75.50	193.94	26.82582	27.18194	8.503605	8.715891	55.6295	55.67221	74.0769	73.97595	330.581811	388.91978	0	25.34825	25.34825
	8	GULF MAS	20.73	29.37	14.61244	14.80642	4.632045	4.74768	10.84618	10.93945	13.81983	13.86031	88.2643533	103.84042	0	13.80758	13.80758
	9	KOTA JUTA	59.17	135.84	16.35721	16.57435	5.185125	5.314568	33.92043	33.94647	45.16884	45.10729	201.574275	237.14621	0	15.45625	15.45625
	10	SINAR SABANG	64.41	153.79	5.888594	5.966767	1.866645	1.913244	12.21135	12.22073	16.26078	16.23862	72.566739	85.372634	0	5.56425	5.56425
	11	BALLENITA	67.55	164.84	20.06484	20.33121	6.36042	6.519203	41.60905	41.641	55.40712	55.33161	247.264444	290.89935	0	18.95967	18.95967
	12	SEASPAN SANTOS	97.06	279.93	9.160036	9.281637	2.90367	2.976158	18.99544	19.01002	25.29455	25.26008	112.881594	132.80188	0	8.6555	8.6555
	13	ANGUS EXPRESS	21.03	29.98	17.88388	18.12129	5.66907	5.810594	13.51518	13.62847	17.24212	17.29048	109.161089	128.42481	0	16.89883	16.89883
	14																
	15																

	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL	2239.619908	2634.84695	2220	-414.847	-18.6868

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Monday, 09 October 2017	1	MERATUS SABANG	11.84	12.95	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.03978	18.38263	18.5475	36.93013						
	2	BBC AFRICA	27.75	44.96	15.92101	16.13237	5.046855	5.172846	17.26985	17.35186	22.49249	22.50984	121.897125	143.40838	17.311	15.04408	32.35508						
	3	SPIL NIKEN	44.62	89.96	10.46861	10.60759	3.31848	3.401323	21.70907	21.72574	28.90806	28.86866	129.007536	151.77357	0	9.892	9.892						
	4	CITRA KARYA PAPUA	20.31	28.50	18.53817	18.78427	5.876475	6.023177	13.407	13.52661	17.05116	17.10425	110.311104	129.77777	0	17.51708	17.51708						
	5	MERATUS GORONTALO	28.92	47.74	14.17625	14.36444	4.493775	4.605959	16.24119	16.3111	21.20563	21.21684	112.615182	132.48845	0	13.39542	13.39542						
	6	MERATUS KARIMATA	16.71	21.42	11.77719	11.93353	3.73329	3.826489	7.612556	7.691795	9.598635	9.6368	65.810286	77.423866	0	11.1285	11.1285						
	7	SITU MAS	48.60	101.91	11.77719	11.93353	3.73329	3.826489	24.42271	24.44146	32.52157	32.47725	145.133478	170.74527	0	11.1285	11.1285						
	8	MARINA STAR 2	26.76	42.63	22.0277	22.32013	6.982635	7.156951	22.76622	22.88375	29.58199	29.61153	163.33091	192.15401	0	20.81442	20.81442						
	9	AYER MAS	9.80	9.82	16.13911	16.35336	5.11599	5.243707	10.43202	10.54061	13.15369	13.20598	90.184466	106.09937	8.243333	15.25017	23.4935						
	10	TOMINI DIGNITY	52.85	115.20	20.71913	20.99418	6.567825	6.731786	42.96587	42.99886	57.21387	57.1359	255.327415	300.38519	0	19.57792	19.57792						
	11	MUTIARA PERSADA 3	28.02	45.59	9.814324	9.944612	3.111075	3.188741	10.78091	10.83098	14.04948	14.05951	75.7796332	89.15251	3.379767	9.27375	12.65352						
	12	BALLENITA	54.42	120.21	25.08105	25.41401	7.950525	8.149004	52.01132	52.05125	69.25889	69.16451	309.080555	363.62418	0	23.69958	23.69958						
	13																						
	14																						
	16																						
	17																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													1688.1615	1986.0724			232.5857	1885.859302	2218.658	2080	-138.658	-6.66625	

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Tuesday, 10 October 2017	1	KABOGA BARU	12.83	14.56	12.21338	12.37552	3.87156	3.96821	5.095515	5.187761	6.13734	6.190652	55.0399364	64.752866	5.770333	11.54067	17.311						
	2	MEDELIN EXPO	27.17	43.59	17.88388	18.12129	5.66907	5.810594	18.861	18.95505	24.53188	24.554	134.386769	158.10208	0	16.89883	16.89883						
	3	SPIL NINGSIH	39.52	75.34	18.75626	19.00526	5.94561	6.094037	32.85674	32.90833	43.55904	43.51809	202.643359	238.40395	0	17.72317	17.72317						
	4	TANTO BAGUS	16.12	20.33	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.03978	6.1825	18.5475	24.73						
	5	MERATUS BANJAR 1	13.47	15.64	10.03242	10.1656	3.18021	3.259601	6.48477	6.55227	8.176615	8.209126	56.060614	65.953664	0	9.479833	9.479833						
	6	LINTAS ASAHAN	15.06	18.42	16.13911	16.35336	5.11599	5.243707	10.43202	10.54061	13.15369	13.20598	90.184466	106.09937	0	15.25017	15.25017						
	7	MERATUS BORNEO	9.68	9.66	15.48482	15.69039	4.908585	5.031124	10.0091	10.11329	12.62043	12.67061	86.528339	101.79805	17.311	14.63192	31.94292						
	8	MERATUS MALINO	25.32	39.32	23.77247	24.08806	7.535715	7.723838	22.84347	22.97651	29.57146	29.6118	168.123319	197.79214	0	22.46308	22.46308						
	9	AYER MAS	7.96	7.26	11.99528	12.15453	3.802425	3.89735	7.753529	7.834236	9.776388	9.815259	67.028995	78.857641	2.060833	11.33458	13.39542						
	10	GRIYA MELAYU	24.22	36.85	19.19246	19.44724	6.08388	6.235759	17.40121	17.51237	22.45435	22.49204	130.819303	153.90506	0	18.13533	18.13533						
	11	PULAU HOKI	17.04	22.04	16.5753	16.79534	5.25426	5.385428	10.71397	10.82549	13.50919	13.5629	92.621884	108.96692	0	15.66233	15.66233						
	12	TIGER SUMMER	16.27	20.61	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.026518	0	12.365	12.365						
	13	LAGUN MAS	13.13	15.07	21.59151	21.87815	6.844365	7.015229	13.95635	14.10162	17.5975	17.66747	120.652191	141.94375	0	20.40225	20.40225						
	14																						
	15																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													1386.89553	1631.6418			235.7593	1587.290959	1867.40113	2148	280.5989	13.06326	

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Wednesday, 11 October 2017	1	NRS 5	2.73	1.52	22.90009	23.20409	7.259175	7.440395	14.80219	14.95627	18.66401	18.73822	127.964445	150.54641	9.892	21.63875	31.53075
	2	RELIANCE	11.53	12.46	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.36427	4.946	14.42583	19.37183
	3	INTAN DAYA	14.24	16.96	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.70202	8.243333	16.48667	24.73
	4	TANTO HEMAT	9.29	9.09	11.1229	11.27056	3.525885	3.613906	7.189636	7.264473	9.065378	9.101422	62.154159	73.12254	0	10.51025	10.51025
	5	WARNOW CHIEF	24.53	37.55	16.13911	16.35336	5.11599	5.243707	14.87812	14.97071	19.21655	19.24703	111.164583	130.78186	0	15.25017	15.25017
	6	BILITON 15	2.95	1.70	11.341	11.49155	3.59502	3.684767	7.330609	7.406914	9.24313	9.279881	63.372868	74.556315	0	10.71633	10.71633
	7	LEGUNDI	7.43	6.56	7.633363	7.734698	2.419725	2.480132	4.934064	4.985423	6.221338	6.246074	42.654815	50.182135	1.895967	7.212917	9.108883
	8	LAGUN MAS	9.79	9.81	7.415267	7.513706	2.35059	2.409271	4.793091	4.842982	6.043585	6.067615	41.436106	48.74836	0	7.006833	7.006833
	9	AYER MAS	6.05	4.86	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.36427	0	14.42583	14.42583
	10	ISA GLORY	21.01	29.93	8.723843	8.839655	2.7654	2.834436	6.584047	6.639342	8.398896	8.422529	53.208149	62.597822	1.648667	8.243333	9.892
	11	TIMUR LAUT MAS	15.04	18.38	24.42676	24.75103	7.74312	7.936421	15.789	15.95335	19.90828	19.98744	136.495408	160.58283	6.594667	23.08133	29.676
	12	SPIL NINGSIH	29.38	48.85	15.26673	15.4694	4.83945	4.960263	17.86486	17.9388	23.3473	23.35754	123.04433	144.75804	0	14.42583	14.42583
	13	MERATUS BENOA	7.67	6.87	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.36427	4.121667	14.42583	18.5475
	14																
	15																
	16																
	17																

	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL	1297.833857	1526.86336	1880	353.1366	18.78386

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Thursday, 12 October 2017	1	PULAU HOKI	10.97	11.59	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.195394	14.01367	13.39542	27.40908
	2	AYER MAS	6.30	5.16	7.415267	7.513706	2.35059	2.409271	4.793091	4.842982	6.043585	6.067615	41.436106	48.74836	0	7.006833	7.006833
	3	SAWU SEA	12.48	13.99	17.01149	17.23733	5.39253	5.52715	10.99591	11.11037	13.8647	13.91982	95.059302	111.83447	0	16.0745	16.0745
	4	MARINA STAR 2	15.70	19.57	4.143826	4.198836	1.313565	1.346357	2.678492	2.706372	3.377298	3.390726	23.155471	27.241731	1.813533	3.915583	5.729117
	5	LUMOSO SELAMAT	7.87	7.13	12.64957	12.8175	4.00983	4.109932	8.176449	8.261558	10.30965	10.35064	70.685122	83.158967	0	11.95283	11.95283
	6	PRAKA VENTURE	12.33	13.74	12.64957	12.8175	4.00983	4.109932	8.176449	8.261558	10.30965	10.35064	70.685122	83.158967	2.308133	11.95283	14.26097
	7	ARMADA SETIA	8.86	8.48	21.15532	21.43616	6.706095	6.873507	13.67441	13.81674	17.24199	17.31055	118.214773	139.0762	0	19.99008	19.99008
	8	CHILOE ISLAND	36.92	68.22	15.26673	15.4694	4.83945	4.960263	24.35721	24.40779	32.20051	32.17889	153.680241	180.80028	15.25017	14.42583	29.676
	9	Tb. DRAKO VALIANT	2.03	0.98	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.03978	0	18.5475	18.5475
	10	TELUK FLAMINGGO	9.01	8.70	11.99528	12.15453	3.802425	3.89735	7.753529	7.834236	9.776388	9.815259	67.028995	78.857641	12.365	11.33458	23.69958
	11	OCEAN SUKSES	24.83	38.21	18.53817	18.78427	5.876475	6.023177	17.35844	17.46382	22.43948	22.47318	128.957003	151.71412	11.95283	17.51708	29.46992
	12																
	13																
	14																
	15																

	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL	1131.045983	1330.64233	1840	509.3577	27.68248

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR						
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Friday, 13 October 2017	1	ASIA PESONA	17.00	21.97	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.03978	6.1825	18.5475	24.73				
	2	KIRAN ASYA	33.82	60.01	26.17153	26.51896	8.2962	8.503308	37.03846	37.14214	48.76894	48.75501	241.194551	283.7583	7.419	24.73	32.149				
	3	MENTARI EXPRESS	19.92	27.69	11.99528	12.15453	3.802425	3.89735	8.461413	8.539572	10.74168	10.77708	70.3693346	82.787452	2.473	11.33458	13.80758				
	4	SINAR SUMBA	27.00	43.18	14.83053	15.02741	4.70118	4.818541	15.50631	15.58479	20.16007	20.17908	110.807928	130.36227	2.143267	14.01367	16.15693				
	5	FATIMA 3	8.37	7.80	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.36427	0	14.42583	14.42583				
	6	TANTO SEMANGAT	15.12	18.51	26.82582	27.18194	8.503605	8.715891	17.33971	17.5202	21.86356	21.95049	149.901207	176.35436	4.533833	25.34825	29.88208				
	7	ORIENTAL MUTIARA	17.27	22.48	9.378132	9.502629	2.972805	3.047019	6.06185	6.124948	7.643358	7.673748	52.404487	61.652338	2.7203	8.861583	11.58188				
	8	BILITON 15	2.91	1.67	21.15532	21.43616	6.706095	6.873507	13.67441	13.81674	17.24199	17.31055	118.214773	139.0762	1.154067	19.99008	21.14415				
	9	SEGARA MAS	27.49	44.33	15.92101	16.13237	5.046855	5.172846	17.0502	17.133	22.19296	22.21139	120.860646	142.189	12.365	15.04408	27.40908				
	10	LEGUNDI	7.34	6.44	9.596228	9.72362	3.04194	3.11788	6.202823	6.267389	7.82111	7.852207	53.623196	63.086113	0	9.067667	9.067667				
	11	HAPPY STAR	8.45	7.91	6.542883	6.629741	2.07405	2.125827	4.229198	4.27322	5.332575	5.353778	36.56127	43.013259	0	6.1825	6.1825				
	12	ANSAC COLOMBIA	23.17	34.53	22.4639	22.76211	7.120905	7.298673	19.22074	19.35496	24.71827	24.768	147.70755	173.77359	0	21.22658	21.22658				
	13	LOGISTIC NUSANTARA	11.80	12.90	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.37753	7.419	20.60833	28.02733				
	14																				
	15																				
	16																				
	17																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL													1418.50928	1668.8345			255.7906	1635.931322	1924.62508	2240	315.3749	14.07924

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR						
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Saturday, 14 October 2017	1	KOTA JUTA	38.31	72.00	21.80961	22.09914	6.9135	7.08609	36.60583	36.67158	48.46867	48.4289	228.08332	268.33332	0.824333	20.60833	21.43267				
	2	TANTO HEMAT	12.06	13.31	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.37753	2.473	20.60833	23.08133				
	3	LINTAS BARITO	18.16	24.20	10.9048	11.04957	3.45675	3.543045	7.048663	7.122033	8.887625	8.922963	60.93545	71.688765	10.71633	10.30417	21.0205				
	4	MERATUS PEKAN BARU	25.08	38.77	23.99057	24.30905	7.60485	7.794699	22.75898	22.8943	29.44176	29.48392	168.278124	197.97426	0	22.66917	22.66917				
	5	PRATAMA 3	4.34	2.99	17.01149	17.23733	5.39253	5.52715	10.99591	11.11037	13.8647	13.91982	95.059302	111.83447	3.297333	16.0745	19.37183				
	6	MUTIARA PERSADA	22.15	32.33	21.59151	21.87815	6.844365	7.015229	17.43333	17.5661	22.33884	22.39174	137.059263	161.24619	0	20.40225	20.40225				
	7	SINAR AMBON	22.39	32.86	22.4639	22.76211	7.120905	7.298673	18.39693	18.53412	23.5949	23.64867	143.820207	169.20024	0	21.22658	21.22658				
	8	TELUK BERAU	11.63	12.62	18.53817	18.78427	5.876475	6.023177	11.98273	12.10746	15.10896	15.16904	103.590265	121.8709	2.060833	17.51708	19.57792				
	9	NAJADE	41.35	80.50	14.61244	14.80642	4.632045	4.74768	30.30225	30.32551	40.35083	40.29584	180.073019	211.85061	3.297333	13.80758	17.10492				
	10	MSC IMMA	39.99	76.66	14.39434	14.58543	4.56291	4.676819	25.63473	25.67281	34.00052	33.96703	157.494595	185.28776	0	13.6015	13.6015				
	11	TANTO LESTARI	21.25	30.43	7.633363	7.734698	2.419725	2.480132	5.844601	5.892684	7.462979	7.483248	46.9514285	55.236975	0	7.212917	7.212917				
	12	LUNA BLUE	19.80	27.46	15.04863	15.2484	4.770315	4.889402	10.54037	10.63869	13.37385	13.41862	87.928274	103.44503	0	14.21975	14.21975				
	13	MERATUS SABANG	9.64	9.59	13.74005	13.92246	4.355505	4.464237	8.881315	8.973761	11.19841	11.24293	76.778667	90.327844	1.154067	12.98325	14.13732				
	14	NORD PLUTO	45.18	91.61	17.22959	17.45832	5.461665	5.598011	35.72951	35.75695	47.57785	47.51301	212.324903	249.794	0	16.28058	16.28058				
	15	MERATUS KELIMUTU	17.78	23.45	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.841905	64.519888	0	9.27375	9.27375				
																		TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL													1875.08962	2205.9878			260.613	2096.610659	2466.60077	2470	3.399225	0.13762

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Sunday, 15 October 2017	1	SPIL NIRMALA	34.58	62.00	6.324786	6.40875	2.004915	2.054966	9.227016	9.251079	12.16227	12.15755	59.5913228	70.107439	0	5.976417	5.976417				
	2	KARUNIA SEJATRA	17.04	22.04	18.97436	19.22625	6.014745	6.164898	12.26467	12.39234	15.46447	15.52595	106.027683	124.73845	0	17.92925	17.92925				
	3	KOTA JUTA	46.97	96.95	17.88388	18.12129	5.66907	5.810594	37.08633	37.1148	49.3846	49.3173	220.387874	259.27985	18.13533	16.89883	35.03417				
	4	LOGISTIC NUSANTARA	18.91	25.68	13.95815	14.14345	4.42464	4.535098	9.230482	9.323647	11.66006	11.70427	78.9797971	92.917408	6.100067	13.18933	19.2894				
	5	MILA UTAMA	22.31	32.69	16.13911	16.35336	5.11599	5.243707	13.15593	13.25472	16.86811	16.90704	103.037958	121.22113	2.473	15.25017	17.72317				
	6	ANUGRAH BUANA 8	25.82	40.46	9.596228	9.72362	3.04194	3.11788	9.460034	9.512879	12.26276	12.27788	68.9932156	81.168489	0	9.067667	9.067667				
	7	PRATIWI RAYA	24.87	38.31	13.52196	13.70146	4.28637	4.393376	12.69163	12.76839	16.40878	16.43321	94.2051818	110.82963	0	12.77717	12.77717				
	8	MAHAKAMAH 1	35.48	64.37	12.43148	12.59651	3.940695	4.039071	18.78315	18.82811	24.78781	24.77536	120.182176	141.3908	0	11.74675	11.74675				
	9	TANTO SUBUR 1	39.13	74.26	8.505747	8.618663	2.696265	2.763575	14.69801	14.72213	19.47788	19.4603	90.9425678	106.99126	0	8.03725	8.03725				
	10	SERASI 1	16.01	20.12	15.70292	15.91138	4.97772	5.101985	10.15007	10.25573	12.79818	12.84907	87.747048	103.23182	6.6771	14.838	21.5151				
	11	SEGARA MAS	56.12	125.74	12.64957	12.8175	4.00983	4.109932	26.2318	26.25193	34.93057	34.88297	155.884106	183.39307	0	11.95283	11.95283				
	12	MERATUS BATAM	25.11	38.85	33.80489	34.25366	10.71593	10.98344	32.12936	32.31982	41.56778	41.62689	237.401758	279.29619	0	31.94292	31.94292				
	13	AAMMONIA BOROLINA	-	0.00	15.92101	16.13237	5.046855	5.172846	10.29105	10.39817	12.97593	13.02753	88.965757	104.6656	7.006833	15.04408	22.05092				
	14																				
	15																				
	16																				
	17																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL													1512.34644	1779.2311			225.043	1703.632994	2004.27411	2540	535.7259	21.09157

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR						
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL				
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L				
Monday, 16 October 2017	1	ANSAC COLOMBIA	44.50	89.59	11.55909	11.71254	3.664155	3.755628	23.97043	23.98884	31.91932	31.87582	142.445821	167.58332	0	10.92242	10.92242				
	2	TANTO BERSINAR	35.48	64.36	10.25052	10.38659	3.249345	3.330462	15.48519	15.52228	20.43544	20.42518	99.0850107	116.5706	0	9.685917	9.685917				
	3	LUMOSO GEMBIRA	14.61	17.61	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.03978	0	18.5475	18.5475				
	4	RSP 2	38.11	71.46	13.52196	13.70146	4.28637	4.393376	22.53437	22.57571	29.83069	29.80683	140.650765	165.47149	0	12.77717	12.77717				
	5	NOAH 7	4.42	3.08	32.27822	32.70672	10.23198	10.48741	20.86404	21.08122	26.30737	26.41197	180.368932	212.19874	0	30.50033	30.50033				
	6	NORTHERN VIVACITY	74.22	189.17	15.04863	15.2484	4.770315	4.889402	31.20679	31.23075	41.55534	41.4987	185.448333	218.17451	0	14.21975	14.21975				
	7	TANTO RAYA	23.18	34.55	13.08577	13.25948	4.1481	4.251654	11.20336	11.28152	14.40828	14.43722	86.0753811	101.26515	0	12.365	12.365				
	8	ORIENTAL EMERALD	30.44	51.46	15.70292	15.91138	4.97772	5.101985	19.27455	19.34737	25.24065	25.24676	130.803324	153.88626	0	14.838	14.838				
	9	TAICHUNG	46.61	95.89	13.52196	13.70146	4.28637	4.393376	28.04088	28.06241	37.33958	37.28869	166.634734	196.04086	0	12.77717	12.77717				
	10	CSCL SANTIAGO	78.79	206.41	13.30386	13.48047	4.217235	4.322515	27.58861	27.60979	36.73733	36.68726	163.947077	192.87891	0	12.57108	12.57108				
	11	KOTA NASRAT	61.12	142.43	16.35721	16.57435	5.185125	5.314568	33.92043	33.94647	45.16884	45.10729	201.574275	237.14621	0	15.45625	15.45625				
	12	MENTARI SUCCESS	14.92	18.16	13.30386	13.48047	4.217235	4.322515	8.599368	8.68888	10.8429	10.88601	74.341249	87.460293	0	12.57108	12.57108				
	13																				
	14																				
	15																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL													1681.05871	1977.7161			177.2317	1831.705628	2154.9478	2170	15.0522	0.69365

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Tuesday, 17 October 2017	1	NORTHERN VIVACITY	85.60	232.98	14.61244	14.80642	4.632045	4.74768	30.30225	30.32551	40.35083	40.29584	180.073019	211.85061	0	13.80758	13.80758
	2	KISIK MAS	22.97	34.11	20.28294	20.5522	6.429555	6.590064	17.16619	17.28807	22.06145	22.10728	132.477742	155.85617	0	19.16575	19.16575
	3	PEK 246	6.13	4.96	20.28294	20.5522	6.429555	6.590064	13.11051	13.24698	16.53098	16.59671	113.339937	133.3411	0	19.16575	19.16575
	4	MT. KATO MAS	19.41	26.66	11.341	11.49155	3.59502	3.684767	7.745259	7.820071	9.808561	9.843278	65.3295034	76.858239	13.76637	10.71633	24.4827
	5	PEKAN FAJAR	21.28	30.49	25.73534	26.07698	8.15793	8.361586	19.73965	19.90163	25.20862	25.27678	158.458519	186.42179	0	24.31783	24.31783
	6	NAVIGATOR ARIES	44.19	88.69	19.62865	19.88922	6.22215	6.377481	40.70451	40.73576	54.20261	54.12875	241.88913	284.57545	2.473	18.5475	21.0205
	7	CSCL SANTIAGO	88.03	242.72	13.52196	13.70146	4.28637	4.393376	28.04088	28.06241	37.33958	37.28869	166.634734	196.04086	7.419	12.77717	20.19617
	8	TAICHUNG	51.16	109.86	3.92573	3.977845	1.24443	1.275496	8.140902	8.147152	10.84052	10.82575	48.377826	56.915089	0	3.7095	3.7095
	9	NEW GLORY	36.97	68.35	28.78868	29.17086	9.12582	9.353639	46.01588	46.11095	60.83707	60.79588	290.198787	341.41034	0	27.203	27.203
	10	DAHLIA	11.15	11.86	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.53315	3.9568	15.45625	19.41305
	11																
	12																
	13																
	14																
	15																
	16																
	17																
TOTAL													1488.18237	1750.8028			192.4818

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1651.791931	1943.28463	1930	-13.2846252	-0.68832

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Wednesday, 18 October 2017	1	NORDWOGE	80.50	213.01	17.44769	17.67931	5.5308	5.668872	36.18179	36.20957	48.1801	48.11444	215.01256	252.95595	0	16.48667	16.48667
	2	TANTO PERMAI	50.03	106.32	12.64957	12.8175	4.00983	4.109932	26.2318	26.25193	34.93057	34.88297	155.884106	183.39307	0	11.95283	11.95283
	3	GULF MAS	29.29	48.64	20.71913	20.99418	6.567825	6.731786	24.14614	24.24685	31.5506	31.56498	166.521488	195.90763	0	19.57792	19.57792
	4	MERATUS MAKASSAR	52.23	113.22	17.44769	17.67931	5.5308	5.668872	36.18179	36.20957	48.1801	48.11444	215.01256	252.95595	3.4622	16.48667	19.94887
	5	NIRBITA	63.73	151.41	21.37342	21.65715	6.77523	6.944368	44.32269	44.35672	59.02062	58.94019	263.390386	309.87104	2.473	20.19617	22.66917
	6	NOAH 7	6.56	5.47	14.39434	14.58543	4.56291	4.676819	9.304235	9.401083	11.73167	11.77831	80.434794	94.629169	0	13.6015	13.6015
	7	SAVIOUR	26.44	41.90	26.17153	26.51896	8.2962	8.503308	26.62733	26.76847	34.57194	34.6091	192.066838	225.96099	9.562267	24.73	34.29227
	8	LENA	29.85	49.99	14.39434	14.58543	4.56291	4.676819	17.20468	17.2731	22.505	22.51288	117.715175	138.48844	4.121667	13.6015	17.72317
	9	TANTO SENTOSA	28.45	46.61	22.68199	22.9831	7.19004	7.369534	25.42262	25.53651	33.16091	33.1816	177.526312	208.85449	0	21.43267	21.43267
	10	SINAR AMBON	41.94	82.18	14.83053	15.02741	4.70118	4.818541	30.75452	30.77813	40.95309	40.89727	182.760676	215.01256	5.358167	14.01367	19.37183
	11	MILA UTAMA	36.90	68.16	5.01621	5.082801	1.590105	1.629801	7.996526	8.013169	10.57123	10.56415	50.4639949	59.369406	0	4.739917	4.739917
	12	SPIL CITRA	89.85	250.09	19.19246	19.44724	6.08388	6.235759	39.79997	39.83052	52.99811	52.92588	236.513816	278.25155	0	18.13533	18.13533
	13	TELUK FLAMINGGO	26.19	41.31	13.30386	13.48047	4.217235	4.322515	13.36344	13.43581	17.33937	17.3591	96.8218124	113.90801	0	12.57108	12.57108
	14																
	15																
TOTAL													2150.12452	2529.5583			232.5032

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
2347.752253	2762.06147	2288	-474.061475	-20.7195

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Thursday, 19 October 2017	1	DONGHAI STAR	73.63	186.96	10.03242	10.1656	3.18021	3.259601	20.80453	20.8205	27.70356	27.6658	123.632222	145.44967	2.473	9.479833	11.95283						
	2	TANTO HORAS	48.08	100.33	26.17153	26.51896	8.2962	8.503308	54.27268	54.31435	72.27015	72.17166	322.51884	379.43393	0	24.73	24.73						
	3	KATOMAS	21.21	30.35	20.71913	20.99418	6.567825	6.731786	15.82566	15.95631	20.20449	20.25969	127.259061	149.71654	0	19.57792	19.57792						
	4	TANTO HANDAL	38.22	71.76	8.723843	8.839655	2.7654	2.834436	14.59659	14.62306	19.32509	19.30941	91.0174864	107.0794	4.039233	8.243333	12.28257						
	5	TANTO STAR	39.99	76.65	22.2458	22.54112	7.05177	7.227812	39.61097	39.66985	52.53762	52.4859	243.370841	286.31864	3.9568	21.0205	24.9773						
	6	FATIMAH 3	20.51	28.91	14.61244	14.80642	4.632045	4.74768	10.69906	10.79287	13.61922	13.66042	87.5701598	103.02372	2.7203	13.80758	16.52788						
	7	NORTHERN DEMOCRAT	95.26	272.35	25.73534	26.07698	8.15793	8.361586	53.36814	53.40911	71.06565	70.9688	317.143526	373.11003	0	24.31783	24.31783						
	8	STAR HIDRA	72.16	181.53	21.15532	21.43616	6.706095	6.873507	43.87042	43.9041	58.41837	58.33876	260.702729	306.70909	0	19.99008	19.99008						
	9	MARINA STAR 2	45.43	92.34	13.95815	14.14345	4.42464	4.535098	28.94543	28.96765	38.54408	38.49155	172.010048	202.36476	2.390567	13.18933	15.5799						
	10	MUTIARA BENOA	22.01	32.05	18.53817	18.78427	5.876475	6.023177	14.85337	14.96777	19.02348	19.06947	117.13617	137.80726	0	17.51708	17.51708						
	11	MUTIARA PERSADA 3	41.36	80.52	8.723843	8.839655	2.7654	2.834436	18.09089	18.10478	24.09005	24.05722	107.50628	126.47798	1.7311	8.243333	9.974433						
	12	TANTO BERKAT	34.59	62.03	11.99528	12.15453	3.802425	3.89735	17.50688	17.55249	23.07641	23.06742	113.052784	133.00328	0	11.33458	11.33458						
	13	MS HAWK	100.40	294.11	25.51724	25.85599	8.088795	8.290725	52.91586	52.95649	70.4634	70.36737	314.455869	369.94808	2.7203	24.11175	26.83205						
	14	NAVIGATOR GLOBAL	49.47	104.60	17.22959	17.45832	5.461665	5.598011	35.72951	35.75695	47.57785	47.51301	212.324903	249.794	2.473	16.28058	18.75358						
	15	KAWA MAS	16.76	21.53	18.97436	19.22625	6.014745	6.164898	12.26467	12.39234	15.46447	15.52595	106.027683	124.73845	0	17.92925	17.92925						
	16	KMTC CENNAI	120.90	385.78	12.86767	13.03849	4.078965	4.180793	26.68407	26.70455	35.53282	35.4844	158.571763	186.55502	0	12.15892	12.15892						
																		TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													2874.30037	3381.5298			284.4362	3116.07115	3665.96606	2770	-895.966059	-32.3453	

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Friday, 20 October 2017	1	ARMADA SEJATI	33.89	60.20	11.341	11.49155	3.59502	3.684767	16.09625	16.14101	21.19628	21.19002	104.735894	123.2187	20.93807	10.71633	31.6544						
	2	SWARNA BAHTERA	40.02	76.75	11.99528	12.15453	3.802425	3.89735	21.38519	21.41685	28.36502	28.33701	131.353657	154.53371	0	11.33458	11.33458						
	3	LAGUN MAS	23.03	34.24	15.26673	15.4694	4.83945	4.960263	12.96472	13.0563	16.66531	16.69959	99.9217514	117.555	10.71633	14.42583	25.14217						
	4	SENDANG MAS	68.56	168.46	15.48482	15.69039	4.908585	5.031124	32.11134	32.13599	42.75984	42.70157	190.823647	224.49841	0	14.63192	14.63192						
	5	PALUNG MAS	16.44	20.92	10.03242	10.1656	3.18021	3.259601	6.48477	6.55227	8.176615	8.209126	56.060614	65.953664	0	9.479833	9.479833						
	6	SELATAN DAMAI	27.41	44.16	10.9048	11.04957	3.45675	3.543045	11.63655	11.69341	15.14383	15.15665	82.5846021	97.158355	0	10.30417	10.30417						
	7	WAN HAI 281	53.75	118.06	21.59151	21.87815	6.844365	7.015229	44.77496	44.80934	59.62287	59.54162	266.078043	313.03299	5.9352	20.40225	26.33745						
	8	MERATUS KAMPAR	22.52	33.14	13.52196	13.70146	4.28637	4.393376	11.15707	11.23935	14.31619	14.34815	86.9639238	102.3105	2.637867	12.77717	15.41503						
	9	NORTHERN DEMOCRATION	95.39	272.90	11.99528	12.15453	3.802425	3.89735	24.87498	24.89408	33.12382	33.07868	147.821135	173.90722	0	11.33458	11.33458						
	10	NIRBITA	47.09	97.33	14.83053	15.02741	4.70118	4.818541	30.75452	30.77813	40.95309	40.89727	182.760676	215.01256	0	14.01367	14.01367						
	11	SOPHIA	31.85	54.98	18.53817	18.78427	5.876475	6.023177	24.18811	24.26892	31.75266	31.75285	161.184621	189.62897	1.648667	17.51708	19.16575						
	12	KIRAN ASYA	67.65	165.20	20.06484	20.33121	6.36042	6.519203	41.60905	41.641	55.40712	55.33161	247.264444	290.89935	7.336567	18.95967	26.29623						
	13																						
	14																						
	15																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													1757.55301	2067.7094			215.1098	1940.396323	2282.8192	2170	-112.819204	-5.19904	

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR		
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Saturday, 21 October 2017	1	NEW LIFE	44.43	89.39	23.11818	23.42508	7.32831	7.511255	47.94087	47.97767	63.83863	63.75163	284.891642	335.16664	1.2365	21.84483	23.08133
	2	MUARA MAS	18.14	24.16	13.30386	13.48047	4.217235	4.322515	8.599368	8.68888	10.8429	10.88601	74.341249	87.460293	5.028433	12.57108	17.59952
	3	RORO PRAYASTI	41.10	79.79	16.7934	17.01634	5.323395	5.456289	31.06058	31.10087	41.24009	41.19537	189.186323	222.57215	0	15.86842	15.86842
	4	MERATUS DILI	20.03	27.92	22.0277	22.32013	6.982635	7.156951	15.65297	15.79609	19.88211	19.94655	129.765138	152.66487	0	20.81442	20.81442
	5	MERATUS PALEMBANG	21.09	30.11	8.069555	8.176681	2.557995	2.621853	6.121726	6.172761	7.81191	7.833616	49.3660972	58.077761	0	7.625083	7.625083
	6	TANTO DAMAI	28.20	46.01	13.08577	13.25948	4.1481	4.251654	14.49518	14.5615	18.89713	18.90991	101.608727	119.53968	7.419	12.365	19.784
	7	SINAR SABANG	67.54	164.80	10.46861	10.60759	3.31848	3.401323	21.70907	21.72574	28.90806	28.86866	129.007536	151.77357	2.060833	9.892	11.95283
	8	NEW LIFE	33.32	58.72	12.86767	13.03849	4.078965	4.180793	17.84673	17.89901	23.4819	23.47684	116.870398	137.49459	0	12.15892	12.15892
	9	MERATUS KAMPAR	19.54	26.93	8.505747	8.618663	2.696265	2.763575	5.857568	5.913502	7.422726	7.448525	49.2265711	57.913613	1.813533	8.03725	9.850783
	10	KANAL MAS	17.48	22.88	5.670498	5.745776	1.79751	1.842383	3.665305	3.703457	4.621565	4.639941	31.686434	37.278158	7.6663	5.358167	13.02447
	11	MERATUS KARIMATA	23.23	34.67	12.21338	12.37552	3.87156	3.96821	10.48801	10.56085	13.49074	13.51759	80.4858653	94.689253	0	11.54067	11.54067
	12	PULAU NUNUKAN	17.89	23.68	9.378132	9.502629	2.972805	3.047019	6.06185	6.124948	7.643358	7.673748	52.404487	61.652338	0	8.861583	8.861583
	13	ISA WINTER	33.80	59.96	16.7934	17.01634	5.323395	5.456289	23.74656	23.81316	31.26642	31.25758	154.673133	181.96839	2.473	15.86842	18.34142
	14				25.00126	25.33316	0	0	0	0	0	0	50.334415	59.216959	0	9.685917	9.685917
	15				19.68184	19.94312	0	0	0	0	0	0	39.624965	46.617606	0	7.625083	7.625083
	16				5.319417	5.390033	0	0	0	0	0	0	10.70945	12.599353	0	2.060833	2.060833
	17																

																		TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL													1544.18243	1816.6852			209.8753	1722.576408	2026.56048	2160	133.4395199	6.177756

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR		
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Sunday, 22 October	1	RELIANCE	19.27	26.39	16.5753	16.79534	5.25426	5.385428	11.2199	11.3296	14.1991	14.25033	95.0092732	111.77562	0	15.66233	15.66233
	2	SOPHIA	23.00	34.18	10.9048	11.04957	3.45675	3.543045	9.245803	9.311267	11.88373	11.90828	71.3032443	83.88617	2.473	10.30417	12.77717
	3	ARMADA PURNAMA	27.82	45.12	17.66578	17.9003	5.599935	5.739733	19.22537	19.31614	25.04323	25.06218	135.552676	159.47374	7.089267	16.69275	23.78202
	4	SPIL HAYU	20.74	29.37	4.361922	4.419827	1.3827	1.417218	3.237975	3.265817	4.125746	4.137827	26.3490319	30.998861	3.2149	4.121667	7.336567
	5	MERATUS KENDARI	20.32	28.51	16.13911	16.35336	5.11599	5.243707	11.67527	11.77939	14.84903	14.89523	96.0510879	113.00128	0	15.25017	15.25017
	6	SIN HUAT HUAT 1	4.45	3.10	19.19246	19.44724	6.08388	6.235759	12.40565	12.53478	15.64222	15.70441	107.246392	126.17223	2.9676	18.13533	21.10293
	7	MERATUS MEDAN 1	35.13	63.43	23.11818	23.42508	7.32831	7.511255	34.45289	34.53824	45.44594	45.42513	221.245034	260.28827	14.17853	21.84483	36.02337
	8	TANTO SENTOSA	18.38	24.62	18.97436	19.22625	6.014745	6.164898	12.26467	12.39234	15.46447	15.52595	106.027683	124.73845	5.4406	17.92925	23.36985
	9	KANAL MAS	14.59	17.57	20.50103	20.77319	6.49869	6.660925	13.25149	13.38942	16.70874	16.77517	114.558646	134.77488	0	19.37183	19.37183
	10	TANTO HARMONI	11.33	12.15	12.64957	12.8175	4.00983	4.109932	8.176449	8.261558	10.30965	10.35064	70.685122	83.158967	5.358167	11.95283	17.311
	11	IRIS MANDIRI	15.36	18.94	17.88388	18.12129	5.66907	5.810594	11.55981	11.68013	14.57571	14.63366	99.934138	117.56957	0	16.89883	16.89883
	12																
	13																
	14																
	15																

																		TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL													1143.96233	1345.838			208.8861	1321.515485	1554.7241	2160	605.2759001	28.02203

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Monday, 23 October 2017	1	ST AYLON	34.97	63.01	22.4639	22.76211	7.120905	7.298673	33.27033	33.354	43.87681	43.8576	214.004326	251.76979	10.22173	21.22658	31.44832						
	2	DARMA KARTIKA 9	21.55	31.07	15.70292	15.91138	4.97772	5.101985	12.24241	12.34054	15.65137	15.69199	97.6203059	114.84742	4.039233	14.838	18.87723						
	3	MERATUS KENDARI 1	16.77	21.54	12.43148	12.59651	3.940695	4.039071	8.035475	8.119117	10.13189	10.17218	69.466413	81.725192	10.71633	11.74675	22.46308						
	4	TANTO SENANG	11.60	12.57	17.88388	18.12129	5.66907	5.810594	11.55981	11.68013	14.57571	14.63366	99.934138	117.56957	17.39343	16.89883	34.29227						
	5	COUGAR	23.76	35.83	11.99528	12.15453	3.802425	3.89735	10.6072	10.67763	13.66775	13.69262	80.494783	94.699745	2.637867	11.33458	13.97245						
	6	SAWU SEA	16.64	21.30	23.11818	23.42508	7.32831	7.511255	14.94316	15.09871	18.84177	18.91668	129.183154	151.98018	3.297333	21.84483	25.14217						
	7	KANAL MAS	11.73	12.78	8.941939	9.060646	2.834535	2.905297	5.779903	5.840067	7.287853	7.316829	49.967069	58.784787	0	8.449417	8.449417						
	8	TRANS PASIFIK 06	4.02	2.68	16.13911	16.35336	5.11599	5.243707	10.43202	10.54061	13.15369	13.20598	90.184466	106.09937	0	15.25017	15.25017						
	9	PEDHOULAS FARMER	56.82	128.04	14.39434	14.58543	4.56291	4.676819	29.84997	29.87289	39.74858	39.69441	177.385362	208.68866	0	13.6015	13.6015						
	10																						
	11																						
	12																						
	13																						
	14																						
	15																						
	16																						
	17																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													1008.24002	1186.1647			183.4966	1164.212127	1369.66133	2020	650.3386746	32.19498	

					FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Tuesday, 24 October 2017	1	TANTO SENTOSA	9.83	9.87	13.95815	14.14345	4.42464	4.535098	9.022288	9.116202	11.37616	11.42139	77.997376	91.761619	26.7084	13.18933	39.89773						
	2	SINAR PAPUA	10.48	10.84	13.30386	13.48047	4.217235	4.322515	8.599368	8.68888	10.8429	10.88601	74.341249	87.460293	0	12.57108	12.57108						
	3	DHAMA KARTIKA IX	14.46	17.35	7.851459	7.955689	2.48886	2.550992	5.075037	5.127863	6.39909	6.424533	43.873524	51.615911	3.050033	7.419	10.46903						
	4	ANTHOS	30.01	50.39	23.99057	24.30905	7.60485	7.794699	28.88196	28.99524	37.79128	37.80339	197.171035	231.96592	0	22.66917	22.66917						
	5	DARYA LOK	31.76	54.75	17.44769	17.67931	5.5308	5.668872	22.67446	22.75084	29.76101	29.76163	151.274605	177.97012	2.143267	16.48667	18.62993						
	6	MERATUS PALEMBANG	9.45	9.32	17.22959	17.45832	5.461665	5.598011	11.13689	11.25281	14.04245	14.09828	96.278011	113.26825	0.577033	16.28058	16.85762						
	7	SPIL CAYA	30.58	51.81	9.814324	9.944612	3.111075	3.188741	12.12233	12.16757	15.87868	15.88213	82.1094486	96.599351	2.390567	9.27375	11.66432						
	8	SERASI 2	8.85	8.47	32.71441	33.14871	10.37025	10.62914	21.14599	21.3661	26.66288	26.76889	182.80635	215.06629	0	30.9125	30.9125						
	9	TELUK BERAU	7.72	6.94	22.90009	23.20409	7.259175	7.440395	14.80219	14.95627	18.66401	18.73822	127.964445	150.54641	2.390567	21.63875	24.02932						
	10	TANTO TERANG	15.93	19.99	16.5753	16.79534	5.25426	5.385428	10.71397	10.82549	13.50919	13.5629	92.621884	108.96692	0	15.66233	15.66233						
	11	MERATUS ULTIMA	17.00	21.98	7.633363	7.734698	2.419725	2.480132	4.934064	4.985423	6.221338	6.246074	42.654815	50.182135	1.895967	7.212917	9.108883						
	12	MSC IMMA	28.20	46.02	32.93251	33.3697	10.43939	10.7	36.48623	36.65312	47.5669	47.59904	255.746878	300.87868	0	31.11858	31.11858						
	13	ORIENTAL GALAXY	20.20	28.27	10.9048	11.04957	3.45675	3.543045	7.832048	7.902599	9.955877	9.987371	64.6320617	76.03772	0	10.30417	10.30417						
	14	MENTARI SEMANGAT	15.38	18.98	11.1229	11.27056	3.525885	3.613906	7.189636	7.264473	9.065378	9.101422	62.154159	73.12254	0	10.51025	10.51025						
	15																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													1551.62584	1825.4422			264.4049	1776.37002	2089.84708	2650	560.1529176	21.13785	

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR		
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Wednesday, 25 October 2017	1	MERATUS MEDAN 1	11.89	13.04	7.415267	7.513706	2.35059	2.409271	4.793091	4.842982	6.043585	6.067615	41.436106	48.74836	0	7.006833	7.006833
	2	STAR OF LUCK	13.91	16.39	10.9048	11.04957	3.45675	3.543045	7.048663	7.122033	8.887625	8.922963	60.93545	71.688765	0	10.30417	10.30417
	3	MERATUS BONTANG	3.89	2.55	13.95815	14.14345	4.42464	4.535098	9.022288	9.116202	11.37616	11.42139	77.997376	91.761619	0	13.18933	13.18933
	4	SITU MAS	16.56	21.15	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.03978	0	18.5475	18.5475
	5	CAPE MORETON	21.49	30.94	14.39434	14.58543	4.56291	4.676819	11.18307	11.27316	14.29371	14.33114	89.3005701	105.05949	1.2365	13.6015	14.838
	6	DOROLONDA	14.14	16.80	14.61244	14.80642	4.632045	4.74768	9.445208	9.543524	11.90942	11.95677	81.653503	96.062945	0	13.80758	13.80758
	7	WARNOW CHIEF	13.72	16.06	22.2458	22.54112	7.05177	7.227812	14.37927	14.52895	18.13076	18.20284	124.308318	146.24508	0	21.0205	21.0205
	8	MERATUS GORONTALO	10.81	11.33	18.75626	19.00526	5.94561	6.094037	12.1237	12.2499	15.28672	15.3475	104.808974	123.30468	0	17.72317	17.72317
	9	TAL STAR	7.79	7.03	13.30386	13.48047	4.217235	4.322515	8.599368	8.68888	10.8429	10.88601	74.341249	87.460293	3.791933	12.57108	16.36302
	10	TRANS PASIFIK 06	1.70	0.76	26.60772	26.96095	8.43447	8.64503	17.19874	17.37776	21.68581	21.77203	148.682498	174.92059	0	25.14217	25.14217
	11	MENTARI SEMANGAT	6.97	5.98	12.64957	12.8175	4.00983	4.109932	8.176449	8.261558	10.30965	10.35064	70.685122	83.158967	4.286533	11.95283	16.23937
	12	INTAN DAYA 11	9.03	8.72	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.53315	5.605467	15.45625	21.06172
	13	MENTARI SUKSES	5.16	3.85	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.53315	0	15.45625	15.45625
	14	TANTO CERIA	4.66	3.32	17.22959	17.45832	5.461665	5.598011	11.13689	11.25281	14.04245	14.09828	96.278011	113.26825	0	16.28058	16.28058
	15	MERATUS AMBON	5.49	4.22	12.86767	13.03849	4.078965	4.180793	8.317422	8.403998	10.4874	10.5291	71.903831	84.592742	0	12.15892	12.15892
	16																
	17																

																		TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL													1334.82117	1570.3778			239.1391	1538.089403	1809.51694	2680	870.4830552	32.48071

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR		
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Thursday, 26 October 2017	1	KAMILA	5.93	4.72	23.93738	24.25515	5.728149	5.871148	11.68027	11.80186	14.74872	14.80736	112.830028	132.74121	11.6231	19.37183	30.99493
	2	SPIL NINGSIH	9.47	9.35	11.1229	11.27056	3.525885	3.613906	7.189636	7.264473	9.065378	9.101422	62.154159	73.12254	0	10.51025	10.51025
	3	WARNOW CHIEF	8.75	8.33	18.53817	18.78427	5.876475	6.023177	11.98273	12.10746	15.10896	15.16904	103.590265	121.8709	0	17.51708	17.51708
	4	EAST GATE	11.84	12.95	8.941939	9.060646	2.834535	2.905297	5.779903	5.840067	7.287853	7.316829	49.967069	58.784787	7.1717	8.449417	15.62112
	5	CAPE MORETON	14.00	16.55	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.36427	0	14.42583	14.42583
	6	EVER ALLY	6.72	5.66	17.88388	18.12129	5.66907	5.810594	11.55981	11.68013	14.57571	14.63366	99.934138	117.56957	0	16.89883	16.89883
	7	WHITE MIYAGI	4.01	2.67	13.30386	13.48047	4.217235	4.322515	8.599368	8.68888	10.8429	10.88601	74.341249	87.460293	4.946	12.57108	17.51708
	8	SINAR JEPARA	2.73	1.52	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.53315	7.831167	15.45625	23.28742
	9	PONA	15.07	18.42	13.52196	13.70146	4.28637	4.393376	8.740342	8.83132	11.02066	11.06447	75.559958	88.894068	1.9784	12.77717	14.75557
	10	PRATIWI RAYA	2.75	1.53	18.97436	19.22625	6.014745	6.164898	12.26467	12.39234	15.46447	15.52595	106.027683	124.73845	5.1933	17.92925	23.12255
	11	KABONGA BARU 2	1.43	0.59	8.287651	8.397672	2.62713	2.692714	5.356984	5.412745	6.754595	6.781452	46.310942	54.483461	7.831167	7.831167	15.66233
	12	ORIENTAL GALAXY	8.17	7.53	8.723843	8.839655	2.7654	2.834436	5.63893	5.697626	7.1101	7.13837	48.74836	57.351012	0	8.243333	8.243333
	13	PALUNG MAS	4.77	3.43	10.03242	10.1656	3.18021	3.259601	6.48477	6.55227	8.176615	8.209126	56.060614	65.953664	0	9.479833	9.479833
	14	LOUDS ISLAND	11.31	12.12	15.92101	16.13237	5.046855	5.172846	10.29105	10.39817	12.97593	13.02753	88.965757	104.6656	0	15.04408	15.04408
	15																

																		TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL													1101.20303	1295.533			233.0803	1299.321239	1528.61322	2446	917.3867773	37.50559

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Friday, 27 October 2017	1	MENTARI SENTOSA	3.82	2.48	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.026518	0	12.365	12.365
	2	MENTARI PRATAMA	2.21	1.12	12.21338	12.37552	3.87156	3.96821	7.894502	7.976676	9.95414	9.993718	68.247704	80.291416	1.813533	11.54067	13.3542
	3	OCEAN BRIDGE	7.34	6.44	16.5753	16.79534	5.25426	5.385428	10.71397	10.82549	13.50919	13.5629	92.621884	108.96692	0	15.66233	15.66233
	4	LUMOSO SELAMAT	2.77	1.55	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.195394	3.7095	13.39542	17.10492
	5	VALERIE SCHULTE	10.54	10.93	12.43148	12.59651	3.940695	4.039071	8.035475	8.119117	10.13189	10.17218	69.466413	81.725192	0	11.74675	11.74675
	6	HOSANA 7	0.89	0.29	5.01621	5.082801	1.590105	1.629801	3.242385	3.276135	4.088308	4.104563	28.030307	32.976832	0	4.739917	4.739917
	7	PRATAMA 7	0.49	0.13	13.95815	14.14345	4.42464	4.535098	9.022288	9.116202	11.37616	11.42139	77.997376	91.761619	0	13.18933	13.18933
	8	LEGUNDI	2.50	1.33	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.36427	1.7311	14.42583	16.15693
	9	HAI PHUONG SKY	1.82	0.84	16.7934	17.01634	5.323395	5.456289	10.85494	10.96793	13.68694	13.74136	93.840593	110.4007	4.946	15.86842	20.81442
	10	SINAR JEPARA	2.51	1.34	10.03242	10.1656	3.18021	3.259601	6.48477	6.55227	8.176615	8.209126	56.060614	65.953664	9.232533	9.479833	18.71237
	11	MERATUS ULTIMA 2	3.34	2.04	15.04863	15.2484	4.770315	4.889402	9.727154	9.828405	12.26492	12.31369	84.090921	98.930495	6.017633	14.21975	20.23738
	12	MSC GIANNA	12.73	14.41	15.48482	15.69039	4.908585	5.031124	10.0091	10.11329	12.62043	12.67061	86.528339	101.79805	2.2257	14.63192	16.85762
	13	MARINA STAR	6.11	4.93	12.86767	13.03849	4.078965	4.180793	8.317422	8.403998	10.4874	10.5291	71.903831	84.592742	2.9676	12.15892	15.12652
	14	SINAR SUMBA	9.28	9.08	10.03242	10.1656	3.18021	3.259601	6.48477	6.55227	8.176615	8.209126	56.060614	65.953664	0	9.479833	9.479833
	15	MERATUS ULTIMA 1	3.02	1.76	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.03978	0	18.5475	18.5475
	16																
	17																
TOTAL													1132.18066	1331.9772			224.095

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1322.661425	1556.07226	2630	1073.927735	40.83375

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Saturday, 28 October 2017	1	LOUDS ISLAND	15.32	18.87	13.74005	13.92246	4.355505	4.464237	8.881315	8.973761	11.19841	11.24293	76.778667	90.327844	17.5583	12.98325	30.54155
	2	TELUK FLAMINGGO	5.00	3.68	12.64957	12.8175	4.00983	4.109932	8.176449	8.261558	10.30965	10.35064	70.685122	83.158967	0	11.95283	11.95283
	3	SUNGAI MAS	11.10	11.78	18.10197	18.34228	5.738205	5.881455	11.70078	11.82257	14.75346	14.81212	101.152847	119.00335	6.1825	17.10492	23.28742
	4	KOTA JUTA	13.90	16.38	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.36427	1.813533	14.42583	16.23937
	5	SANTIKA NUSANTARA	7.11	6.15	9.378132	9.502629	2.972805	3.047019	6.06185	6.124948	7.643358	7.673748	52.404487	61.652338	0.4946	8.861583	9.356183
	6	HONGKONG BRIDGE	22.57	33.25	17.44769	17.67931	5.5308	5.668872	14.43863	14.54464	18.53034	18.57137	112.411643	132.24899	0	16.48667	16.48667
	7	SURPLUS	3.33	2.03	14.83053	15.02741	4.70118	4.818541	9.586181	9.685964	12.08717	12.13523	82.872212	97.49672	0	14.01367	14.01367
	8	MSC GIANNA	17.82	23.53	18.10197	18.34228	5.738205	5.881455	11.70078	11.82257	14.75346	14.81212	101.152847	119.00335	1.566233	17.10492	18.67115
	9	SINAR SABANG	15.38	18.98	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.03978	6.264933	18.5475	24.81243
	10	TANTO EXPRESS	7.45	6.58	14.83053	15.02741	4.70118	4.818541	9.586181	9.685964	12.08717	12.13523	82.872212	97.49672	5.770333	14.01367	19.784
	11	MAGELAN	3.20	1.92	15.92101	16.13237	5.046855	5.172846	10.29105	10.39817	12.97593	13.02753	88.965757	104.6656	0	15.04408	15.04408
	12	OCEAN BRIDGE	7.17	6.22	12.21338	12.37552	3.87156	3.96821	7.894502	7.976676	9.95414	9.993718	68.247704	80.291416	0	11.54067	11.54067
	13																
	14																
	15																
TOTAL													1032.53694	1214.7493			211.73

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1212.507452	1426.47935	2330	903.5206451	38.77771

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Monday, 29 October 2017	1	CUCKOO HUNTER	27.49	44.34	10.46861	10.60759	3.31848	3.401323	11.21274	11.26718	14.59489	14.60699	79.4778035	93.503298	2.308133	9.892	12.20013						
	2	ARMADA PURNAMA	6.62	5.54	26.17153	26.51896	8.2962	8.503308	16.91679	17.09288	21.3303	21.41511	146.24508	172.05304	0	24.73	24.73						
	3	PULAU NUNUKAN	7.11	6.15	12.64957	12.8175	4.00983	4.109932	8.176449	8.261558	10.30965	10.35064	70.685122	83.158967	1.813533	11.95283	13.76637						
	4	TB. CUMAWUS	1.57	0.68	11.99528	12.15453	3.802425	3.89735	7.753529	7.834236	9.776388	9.815259	67.028995	78.857641	9.562267	11.33458	20.89685						
	5	ORIENTAL DIAMOND	21.81	31.62	16.13911	16.35336	5.11599	5.243707	12.77732	12.87747	16.35182	16.39262	101.2514	119.11929	8.9028	15.25017	24.15297						
	6	MERATUS KAMPAR	12.25	13.62	9.596228	9.72362	3.04194	3.11788	6.202823	6.267389	7.82111	7.852207	53.623196	63.086113	1.154067	9.067667	10.22173						
	7	SLAMET 6	0.98	0.34	10.9048	11.04957	3.45675	3.543045	7.048663	7.122033	8.887625	8.922963	60.93545	71.688765	0	10.30417	10.30417						
	8	SINAR AMBON	4.72	3.38	12.64957	12.8175	4.00983	4.109932	8.176449	8.261558	10.30965	10.35064	70.685122	83.158967	0	11.95283	11.95283						
	9	MARINA STAR 1	11.74	12.79	13.95815	14.14345	4.42464	4.535098	9.022288	9.116202	11.37616	11.42139	77.997376	91.761619	0	13.18933	13.18933						
	10	KOTA JUTA	18.26	24.38	11.99528	12.15453	3.802425	3.89735	7.753529	7.834236	9.776388	9.815259	67.028995	78.857641	0	11.33458	11.33458						
	11	HONGKONG BRIDGE	29.83	49.95	8.505747	8.618663	2.696265	2.763575	10.15733	10.19779	13.28604	13.29074	69.5161611	81.783719	0	8.03725	8.03725						
	12	TANTO SEMANGAT	11.05	11.71	6.542883	6.629741	2.07405	2.125827	4.229198	4.27322	5.332575	5.353778	36.56127	43.013259	0	6.1825	6.1825						
	13	URU BHUM	22.26	32.57	17.01149	17.23733	5.39253	5.52715	13.82491	13.92919	17.72242	17.76366	108.408684	127.53963	11.45823	16.0745	27.53273						
	14	NAVIGATOR GLOBAL	13.09	15.01	11.99528	12.15453	3.802425	3.89735	7.753529	7.834236	9.776388	9.815259	67.028995	78.857641	0	11.33458	11.33458						
	15	MITRA KENDARI	8.76	8.34	11.341	11.49155	3.59502	3.684767	7.330609	7.406914	9.24313	9.279881	63.372868	74.556315	0	10.71633	10.71633						
	16	LAGUN MAS	5.16	3.85	12.21338	12.37552	3.87156	3.96821	7.894502	7.976676	9.95414	9.993718	68.247704	80.291416	0	11.54067	11.54067						
	17	LUMOSO SELAMAT	5.36	4.07	32.44844	32.8792	0.935208	0.958555	1.906984	1.926834	2.407954	2.417528	75.8807067	89.27142	0	14.21975	14.21975						
																		TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													1283.97493	1510.5587			242.3128	1489.940794	1752.87152	2600	847.1284776	32.58186	

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)										FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Sunday, 30 October 2017	1	FELYA	8.80	8.40	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.36427	1.813533	14.42583	16.23937						
	2	CHUKO HUNTER	34.94	62.93	27.26201	27.62392	8.641875	8.857613	40.32565	40.42738	53.17906	53.15599	259.473501	305.26294	0	25.76042	25.76042						
	3	SINAR AMBON	12.53	14.07	12.86767	13.03849	4.078965	4.180793	8.317422	8.403998	10.4874	10.5291	71.903831	84.592742	9.974433	12.15892	22.13335						
	4	NOTHERN DEFENDER	34.38	61.46	23.99057	24.30905	7.60485	7.794699	34.71218	34.80448	45.74157	45.72508	224.682475	264.33232	0	22.66917	22.66917						
	5	DUTA KAPUAS	1.81	0.84	10.46861	10.60759	3.31848	3.401323	6.766716	6.837151	8.53212	8.566044	58.498032	68.821214	3.874367	9.892	13.76637						
	6	ISA EXPRESS	31.08	53.05	11.55909	11.71254	3.664155	3.755628	14.59108	14.64323	19.12929	19.13181	98.1868276	115.51391	12.52987	10.92242	23.45228						
	7	ARMADA PERMATA	13.21	15.20	22.68199	22.9831	7.19004	7.369534	14.66122	14.81383	18.48626	18.55976	126.745736	149.11263	2.060833	21.43267	23.4935						
	8	SPIL CAYA	27.86	45.20	18.97436	19.22625	6.014745	6.164898	20.68159	20.77897	26.94208	26.96227	145.745163	171.4649	2.7203	17.92925	20.64955						
	9	MENTARI PRAKARSA	7.96	7.25	15.48482	15.69039	4.908585	5.031124	10.0091	10.11329	12.62043	12.67061	86.528339	101.79805	0	14.63192	14.63192						
	10	MUTIARA FERINDO	13.20	15.19	9.378132	9.502629	2.972805	3.047019	6.06185	6.124948	7.643358	7.673748	52.404487	61.652338	0.9892	8.861583	9.850783						
	11	TIGA RODA	14.15	16.81	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.026518	4.2041	12.365	16.5691						
	12																						
	13																						
	14																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													1282.60056	1508.9418			209.2158	1460.433991	1718.15764	2310	591.8423631	25.62088	

DATE	NO	SHIP NAME	BOLLARD PULL	ENGINE LOAD	FOC (BASED ON OPERATING MODES)								TOTAL (kg)	TOTAL (L)	FOC GENERATOR								
					LOITERING		WAITING		LOW ASSIST		HIGH ASSIST				QUAY	SERVICE	TOTAL						
			REQUIRED (Ton)	Total (%)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L						
Tuesday, 31 October 2017	1	AS CONSTANTINA	40.38	77.75	14.17625	14.36444	4.493775	4.605959	25.58474	25.62103	33.94684	33.9122	156.705235	184.3591	1.2365	13.39542	14.63192						
	2	DARWIN	41.93	82.14	13.30386	13.48047	4.217235	4.322515	27.58861	27.60979	36.73733	36.68726	163.947077	192.87891	0	12.57108	12.57108						
	3	RORO SAWITRI	13.14	15.08	17.01149	17.23733	5.39253	5.52715	10.99591	11.11037	13.8647	13.91982	95.059302	111.83447	0	16.0745	16.0745						
	4	DA CHENG	11.57	12.52	11.99528	12.15453	3.802425	3.89735	7.753529	7.834236	9.776388	9.815259	67.028995	78.857641	8.820367	11.33458	20.15495						
	5	AS SAVONIA	29.62	49.44	13.08577	13.25948	4.1481	4.251654	15.4827	15.54547	20.24375	20.25169	106.268602	125.02189	1.4838	12.365	13.8488						
	6	MERATUS SABANG	18.06	24.00	6.979075	7.071724	2.21232	2.267549	4.511144	4.558101	5.68808	5.710696	38.998688	45.880809	0	6.594667	6.594667						
	7	HIJAU JELITA	17.80	23.50	8.505747	8.618663	2.696265	2.763575	5.497957	5.555185	6.932348	6.959911	47.529651	55.917236	0	8.03725	8.03725						
	8	ORIENTAL MUTIARA	27.07	43.35	18.53817	18.78427	5.876475	6.023177	19.45162	19.54948	25.29382	25.31725	138.834262	163.33443	0	17.51708	17.51708						
	9	NORTHERN DEFENDER	48.55	101.77	19.41055	19.66823	6.153015	6.30662	40.25224	40.28314	53.60036	53.52731	239.201473	281.4135	8.325767	18.34142	26.66718						
	10	MUTIARA FERINDO 1	19.27	26.40	19.84674	20.11021	6.291285	6.448342	13.43726	13.5686	17.00551	17.06684	113.774798	133.8527	16.3218	18.75358	35.07538						
	11	MENTARI TRADER	19.43	26.70	14.83053	15.02741	4.70118	4.818541	10.1391	10.2369	12.84116	12.8865	85.4813289	100.56627	6.759533	14.01367	20.7732						
	12	MERATUS GORONTALO	24.45	37.36	11.55909	11.71254	3.664155	3.755628	10.60967	10.67615	13.70009	13.72215	79.3994783	93.411151	2.390567	10.92242	13.31298						
	13	AS CONSTANTINA	41.27	80.25	17.44769	17.67931	5.5308	5.668872	36.18179	36.20957	48.1801	48.11444	215.01256	252.95595	0	16.48667	16.48667						
	14	AS SAVONIA	29.62	49.44	13.95815	14.14345	4.42464	4.535098	16.51488	16.58183	21.59333	21.6018	113.353176	133.35668	0	13.18933	13.18933						
	15																						
	16																						
	17																	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%	
TOTAL													1660.59463	1953.6407			234.935	1860.289376	2188.57574	2330	141.4242636	6.069711	

ATTACHMENT 1
FUEL ESTIMATION
(DAILY REPORT WORKING HOUR)

KT. KRESNA 315

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			L	L	L					
Sunday, 01 October 2017	1	TANTO FAJAR 1	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.702024	0.0	16.5	16.5					
	2	TANTO SEMANGAT	19.62865	19.88922	6.22215	6.377481	12.29809	12.43156	15.46658	15.5321	107.845836	126.877454	0.0	18.5	18.5					
	3	MERATUS MALINO	19.62865	19.88922	6.22215	6.377481	11.37452	11.51131	14.20717	14.27722	103.487732	121.750273	0.0	18.5	18.5					
	4	AWLI	15.26673	15.4694	4.83945	4.960263	8.428742	8.53664	10.47988	10.53641	78.5175068	92.3735374	10.7	14.4	25.1					
	5	MENTAYA RIVER	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	0.0	15.5	15.5					
	6	RED ROCK	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	0.0	20.6	20.6					
	7	SINAR BELAWAN	19.62865	19.88922	6.22215	6.377481	10.54902	10.68878	13.08149	13.15559	99.5923797	117.167506	0.0	18.5	18.5					
	8	KOTA JUTA	10.9048	11.04957	3.45675	3.543045	11.06952	11.12842	14.37061	14.38621	79.9089209	94.0104952	0.0	10.3	10.3					
	9	SPIL NIKEN	27.26201	27.62392	8.641875	8.857613	27.75427	27.90123	36.03626	36.07488	200.152054	235.473004	0.0	25.8	25.8					
	10	SPIL NITA	19.62865	19.88922	6.22215	6.377481	19.93105	20.03705	25.87517	25.90323	143.863997	169.251761	9.1	18.5	27.6					
	11	PAN DAISY	23.99057	24.30905	7.60485	7.794699	29.23173	29.34376	38.26824	38.27864	198.821538	233.907692	0.0	22.7	22.7					
	12	SEASPAN FRASER	19.62865	19.88922	6.22215	6.377481	33.42863	33.48606	44.28095	44.24279	207.55592	244.183436	0.0	18.5	18.5					
	13	UNI FORTUNA	15.26673	15.4694	4.83945	4.960263	19.16659	19.23585	25.1224	25.12624	129.186918	151.984609	0.0	14.4	14.4					
																TOTAL (kg)	TOTAL (L)	LOH (L)	MARGIN	%
TOTAL											1659.7036	1952.59247			252.6582	1874.463039	2205.25063	2370	164.7494	6.95145

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR							
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL					
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L					
Monday, 02 October 2017	1	KANG MAY	26.17153	26.51896	8.2962	8.503308	52.55751	52.60535	69.93129	69.84121	314.425371	369.912201	0	24.73	24.73					
	2	GUENTHER SCHUTLE	19.62865	19.88922	6.22215	6.377481	40.70451	40.73576	54.20261	54.12875	241.88913	284.575447	3.297333	18.5475	21.84483					
	3	STRAIT MAS	11.99528	12.15453	3.802425	3.89735	8.963533	9.039886	11.42639	11.45933	72.7387226	85.5749678	0	11.33458	11.33458					
	4	PULAU HOKI	27.26201	27.62392	8.641875	8.857613	15.39509	15.58653	19.18284	19.28211	141.831997	166.861173	0	25.76042	25.76042					
	5	PALU SIPAT	14.17625	14.36444	4.493775	4.605959	11.99139	12.07659	15.41045	15.44251	92.561358	108.895715	7.831167	13.39542	21.22658					
	6	MERATUS GORONTALO	20.71913	20.99418	6.567825	6.731786	19.36002	19.47795	25.02407	25.06193	143.936872	169.337496	0	19.57792	19.57792					
	7	DUTA KAPUAS 17	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.039776	11.95283	18.5475	30.50033					
	8	MITRA SEJAHTERA IX	23.99057	24.30905	7.60485	7.794699	15.50706	15.66847	19.55278	19.63052	134.05799	157.715282	0	22.66917	22.66917					
	9	MERATUS GORONTALO	14.17625	14.36444	4.493775	4.605959	13.24633	13.32702	17.12173	17.14763	98.483123	115.862498	11.95283	13.39542	25.34825					
	10	TIGA RODA	19.62865	19.88922	6.22215	6.377481	9.269105	9.413472	11.33615	11.41653	93.5527617	110.062073	0	18.5475	18.5475					
	11	INTAN DAYA 4	31.62393	32.04375	10.02458	10.27483	26.57001	26.76072	34.13168	34.20409	205.633586	241.921866	0	29.88208	29.88208					
	12																			
	13																			
	14																			
	15															TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL											1648.79472	1939.7585			251.4217	1862.503138	2191.18016	2160	-31.1802	-1.44353

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Tuesday, 03 October 2017	1	OLYMPIA	15.26673	15.4694	4.83945	4.960263	29.50101	29.53309	39.21479	39.16793	177.952658	209.356069	18.5475	14.42583	32.97333
	2	KOTA NABIL	25.08105	25.41401	7.950525	8.149004	51.99802	52.038	69.24076	69.14644	309.017796	363.550348	0	23.69958	23.69958
	3	TANTO LUAS	15.26673	15.4694	4.83945	4.960263	8.012247	8.121644	9.911929	9.970508	76.5521634	90.0613687	0	14.42583	14.42583
	4	CJN 2	16.35721	16.57435	5.185125	5.314568	19.57228	19.64995	25.6032	25.61204	133.868727	157.49262	0	15.45625	15.45625
	5	FREIGH EXPRESS 1	26.17153	26.51896	8.2962	8.503308	19.78614	19.9519	25.24304	25.31378	159.784857	187.982184	0	24.73	24.73
	6	MENTARI PRATAMA	14.17625	14.36444	4.493775	4.605959	7.493983	7.595371	9.277624	9.331754	71.3391502	83.928412	6.1825	13.39542	19.57792
	7	STAR OF LUCK	32.71441	33.14871	10.37025	10.62914	56.26585	56.35958	74.55359	74.48728	348.528806	410.033889	0	30.9125	30.9125
	8	MERATUS PALEMBANG	11.99528	12.15453	3.802425	3.89735	7.467417	7.549154	9.386235	9.426511	65.6789013	77.2692956	0	11.33458	11.33458
	9	SINAR AMBON	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	0	13.39542	13.39542
	10	ISA EXPRESS	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	0	14.42583	14.42583
	11	PAC SCHEDAR	22.90009	23.20409	7.259175	7.440395	47.4886	47.52505	63.23638	63.1502	282.203985	332.004688	0	21.63875	21.63875
	12	MERATUS BONTANG	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	0	13.39542	13.39542
	13	SENDANG MAS	28.35249	28.72888	8.98755	9.211917	58.7954	58.84054	78.29266	78.18597	349.39541	411.053424	0	26.79083	26.79083
	14														
	15														
	16		11.4	16.72											
	17														

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%				
TOTAL					2320.89061	2730.45955			262.7563	2544.233426	2993.2158	2320	-673.2158	-29.0179

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Wednesday, 04 October 2017	1	URU BHUM	19.62865	19.88922	6.22215	6.377481	40.70451	40.73576	54.20261	54.12875	241.88913	284.575447	2.473	18.5475	21.0205
	2	MERATUS BANJAR 1	32.71441	33.14871	10.37025	10.62914	33.86885	34.04318	44.01224	44.05582	242.842589	285.697163	0	30.9125	30.9125
	3	PULAU HOKI	16.35721	16.57435	5.185125	5.314568	23.39053	23.45446	30.80989	30.8	151.886134	178.689569	12.365	15.45625	27.82125
	4	TANTO TERANG	19.62865	19.88922	6.22215	6.377481	40.70451	40.73576	54.20261	54.12875	241.88913	284.575447	0	18.5475	18.5475
	5	PALUNG MAS	11.99528	12.15453	3.802425	3.89735	8.415986	8.49431	10.67974	10.71536	70.1549782	82.5352685	0	11.33458	11.33458
	6	ARMADA PERMATA	8.723843	8.839655	2.7654	2.834436	13.77432	13.80374	18.20382	18.19217	87.1373812	102.514566	0	8.243333	8.243333
	7	ARMADA SERASI	15.26673	15.4694	4.83945	4.960263	13.26615	13.35664	17.07635	17.10915	101.344127	119.228385	0	14.42583	14.42583
	8	DUTA KAPUAS	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	0	15.45625	15.45625
	9	SPRING MAS	10.9048	11.04957	3.45675	3.543045	22.61362	22.63098	30.11256	30.07153	134.38285	158.097471	0	10.30417	10.30417
	10	MERATUS KARIANGAU	14.17625	14.36444	4.493775	4.605959	12.51567	12.59899	16.12538	16.15487	95.0353261	111.806266	0	13.39542	13.39542
	11	EVER ALLY	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	6.594667	14.42583	21.0205
	12	NAVIGATOR ARIES	20.71913	20.99418	6.567825	6.731786	42.96587	42.99886	57.21387	57.1359	255.327415	300.385194	0	19.57792	19.57792
	13	DRAGON LUCKY	8.723843	8.839655	2.7654	2.834436	15.71385	15.73629	20.84863	20.82746	96.2895599	113.281835	0	8.243333	8.243333
	14	URU BHUM	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	0	14.42583	14.42583
	15	SPRING MAS	25.08105	25.41401	7.950525	8.149004	52.01132	52.05125	69.25889	69.16451	309.080555	363.624182	0	23.69958	23.69958

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%				
TOTAL					2494.93433	2935.21686			258.4285	2714.598555	3193.64536	2300	-893.6454	-38.8541

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Thursday, 05 October 2017	1	GRIYA AMBON	16.35721	16.57435	5.185125	5.314568	29.67279	29.71412	39.37662	39.3359	181.530678	213.565503	7.419	15.45625	22.87525
	2	LEO PERDANA	27.26201	27.62392	8.641875	8.857613	56.53404	56.57745	75.28141	75.17881	335.957125	395.243676	0	25.76042	25.76042
	3	PALUNG MAS	16.35721	16.57435	5.185125	5.314568	11.15215	11.26012	14.1212	14.17136	94.1360816	110.748331	5.770333	15.45625	21.22658
	4	MERATUS BORNEO	10.9048	11.04957	3.45675	3.543045	7.048663	7.122033	8.887625	8.922963	60.93545	71.6887647	0	10.30417	10.30417
	5	GAMALISE	9.814324	9.944612	3.111075	3.188741	13.25483	13.29599	17.423	17.42089	87.4534601	102.886424	0	9.27375	9.27375
	6	FREIGH EXPRESS	9.814324	9.944612	3.111075	3.188741	11.13085	11.17966	14.52666	14.53498	77.4308922	91.0951673	0	9.27375	9.27375
	7	TANTO HARMONI	8.723843	8.839655	2.7654	2.834436	15.10773	15.13236	20.0221	20.00391	93.4294343	109.916982	0	8.243333	8.243333
	8	KANG MAY	4.361922	4.419827	1.3827	1.417218	9.045447	9.052391	12.04503	12.02861	53.75314	63.2389882	0	4.121667	4.121667
	9	MENTAYA RIVER	8.723843	8.839655	2.7654	2.834436	6.936325	6.990352	8.879274	8.901178	54.8704632	64.5534861	0	8.243333	8.243333
	10	CSCL KINGSTON	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	0	14.42583	14.42583
	11	MERATUS TANGGUH 1	20.71913	20.99418	6.567825	6.731786	28.48125	28.56636	37.46212	37.45522	186.977875	219.973971	0	19.57792	19.57792
	12	EVER ALLY	15.26673	15.4694	4.83945	4.960263	30.11557	30.14543	40.05283	40.00295	180.852623	212.767791	5.770333	14.42583	20.19617
	13	SURYA PEKIK	19.62865	19.88922	6.22215	6.377481	35.75973	35.80877	47.45973	47.41012	218.555844	257.124522	0	18.5475	18.5475
	14	YOU SHEN 3	21.80961	22.09914	6.9135	7.08609	45.22723	45.26196	60.22513	60.14305	268.7657	316.194941	10.71633	20.60833	31.32467
	15	TANTO TENANG	16.35721	16.57435	5.185125	5.314568	23.92784	23.98984	31.54259	31.53007	154.421601	181.672472	4.121667	15.45625	19.57792
	16	ARMADA SERASI	20.71913	20.99418	6.567825	6.731786	13.76307	13.90114	17.39187	17.45719	117.526192	138.266108	0	19.57792	19.57792
	17														

																TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL											2354.73255	2770.27359			262.5502	2577.900191	3032.82375	2270	-762.8238	-33.6046

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Friday, 06 October 2017	1	TELUK BERAU	11.99528	12.15453	3.802425	3.89735	9.21671	9.292152	11.77164	11.80333	73.9334087	86.9804808	4.533833	11.33458	15.86842
	2	ORIENTAL EMERALD	30.53345	30.93879	9.6789	9.920526	48.20821	48.31119	63.71074	63.66998	304.971789	358.79034	0	28.85167	28.85167
	3	TANTO HANDAL	15.26673	15.4694	4.83945	4.960263	9.205639	9.310741	11.53928	11.592	82.1835008	96.6864715	2.473	14.42583	16.89883
	4	MERATUS DILI	17.44769	17.67931	5.5308	5.668872	22.20407	22.28215	29.11958	29.1225	149.054967	175.358784	0	16.48667	16.48667
	5	KUWIANG	20.71913	20.99418	6.567825	6.731786	30.02904	30.10858	39.57274	39.55825	194.281536	228.566514	0	19.57792	19.57792
	6	SERASI 1	9.814324	9.944612	3.111075	3.188741	7.622412	7.683844	9.742429	9.767959	60.8753939	71.6181105	0	9.27375	9.27375
	7	SPIL CAYA	10.9048	11.04957	3.45675	3.543045	22.61362	22.63098	30.11256	30.07153	134.38285	158.097471	0	10.30417	10.30417
	8	TANTO SUBUR 2	10.9048	11.04957	3.45675	3.543045	8.790994	8.858094	11.26353	11.29032	69.157106	81.3613012	0	10.30417	10.30417
	9	CSCL COSCO SAOPAULO	26.17153	26.51896	8.2962	8.503308	54.27268	54.31435	72.27015	72.17166	322.51884	379.433929	0	24.73	24.73
	10	ORIENTAL GOLD	22.90009	23.20409	7.259175	7.440395	34.52335	34.60646	45.5565	45.53394	221.023992	260.028225	0	21.63875	21.63875
	11	SPIL CITRA	18.53817	18.78427	5.876475	6.023177	38.44315	38.47266	51.19136	51.12159	228.450845	268.7657	4.121667	17.51708	21.63875
	12	PRATAMA 1	26.17153	26.51896	8.2962	8.503308	16.91679	17.09288	21.3303	21.41511	146.24508	172.053035	0	24.73	24.73
	13	MAHKOTA NUSANTARA	15.26673	15.4694	4.83945	4.960263	19.73033	19.79756	25.89113	25.89221	131.847065	155.114194	3.297333	14.42583	17.72317
	14	LINTAS BATANGHARI	17.44769	17.67931	5.5308	5.668872	23.86913	23.94121	31.39011	31.38487	156.911984	184.602334	0	16.48667	16.48667
	15	OOCL NORFOLK	26.17153	26.51896	8.2962	8.503308	54.27268	54.31435	72.27015	72.17166	322.51884	379.433929	2.060833	24.73	26.79083

																TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL											2275.83836	2677.45689			254.5129	2492.174336	2931.96981	2508	-423.9698	-16.9047

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Saturday, 07 October 2017	1	HANSA SIEGBRUG	19.62865	19.88922	6.22215	6.377481	40.70451	40.73576	54.20261	54.12875	241.88913	284.575447	0	18.5475	18.5475
	2	MAHKOTA NUSANTARA	30.53345	30.93879	9.6789	9.920526	39.20801	39.34338	51.43775	51.44115	262.501959	308.825834	0	28.85167	28.85167
	3	TANTO BERKAT	20.71913	20.99418	6.567825	6.731786	27.29676	27.38613	35.8469	35.84581	181.388519	213.398257	6.1825	19.57792	25.76042
	4	BBC NEW YORK	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	1.648667	14.42583	16.0745
	5	SPIL HANA	10.9048	11.04957	3.45675	3.543045	8.313862	8.382679	10.6129	10.64203	66.9056304	78.7125064	0	10.30417	10.30417
	6	MSC GIANNA	11.99528	12.15453	3.802425	3.89735	24.87498	24.89408	33.12382	33.07868	147.821135	173.907218	0	11.33458	11.33458
	7	CSCL COSCO SAOPAULO	9.814324	9.944612	3.111075	3.188741	20.35226	20.36788	27.10131	27.06437	120.944565	142.287724	0	9.27375	9.27375
	8	NBP PERDANA	10.9048	11.04957	3.45675	3.543045	7.048663	7.122033	8.887625	8.922963	60.93545	71.6887647	0	10.30417	10.30417
	9	NORTHERN VOLITION	7.633363	7.734698	2.419725	2.480132	15.82953	15.84168	21.07879	21.05007	94.067995	110.668229	0	7.212917	7.212917
	10	TANTO SENANG	8.723843	8.839655	2.7654	2.834436	8.365835	8.414718	10.82861	10.8435	61.6159885	72.4893982	0	8.243333	8.243333
	11	KOTA JAYA	26.17153	26.51896	8.2962	8.503308	54.27268	54.31435	72.27015	72.17166	322.51884	379.433929	0	24.73	24.73
	12	SPIL NIKEN	21.80961	22.09914	6.9135	7.08609	45.22723	45.26196	60.22513	60.14305	268.7657	316.194941	2.060833	20.60833	22.66917
	13	MERATUS KALABAHI	21.80961	22.09914	6.9135	7.08609	28.3355	28.431	37.19094	37.19175	189.057526	222.420619	8.243333	20.60833	28.85167
	14	SIREMAX	15.26673	15.4694	4.83945	4.960263	20.22101	20.28647	26.56024	26.55891	134.162476	157.838207	9.067667	14.42583	23.4935
	15	PRITHA	17.44769	17.67931	5.5308	5.668872	18.75988	18.85035	24.42295	24.44278	132.802629	156.238387	0	16.48667	16.48667
	16														
	17														

																TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL											2473.51353	2910.01592			262.138	2696.330833	3172.15392	2318	-854.1539	-36.8487

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Sunday, 08 October 2017	1	MUTIARA BARITO	23.99057	24.30905	7.60485	7.794699	18.32058	18.47187	23.38939	23.45333	147.334342	173.33452	7.419	22.66917	30.08817
	2	MEDELIN EXPO	16.35721	16.57435	5.185125	5.314568	33.92043	33.94647	45.16884	45.10729	201.574275	237.146206	5.770333	15.45625	21.22658
	3	MUTIARA FERINDO 1	21.80961	22.09914	6.9135	7.08609	29.11232	29.20503	38.25024	38.24724	192.723154	226.733122	0	20.60833	20.60833
	4	SPIL HANA	27.26201	27.62392	8.641875	8.857613	18.36647	18.54722	23.23472	23.31941	155.853238	183.356751	0	25.76042	25.76042
	5	ORIENTAL EMERALD	21.80961	22.09914	6.9135	7.08609	29.80536	29.89557	39.19529	39.18889	195.993449	230.580528	2.473	20.60833	23.08133
	6	RED ROVER	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.702024	7.419	16.48667	23.90567
	7	NORTHERN VOLITION	33.80489	34.25366	10.71593	10.98344	70.10221	70.15603	93.34894	93.22173	416.586835	490.102159	0	31.94292	31.94292
	8	GULF MAS	13.08577	13.25948	4.1481	4.251654	9.712995	9.796524	12.37597	12.41222	79.0427045	92.991417	0	12.365	12.365
	9	KOTA JUTA	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	0	14.42583	14.42583
	10	SINAR SABANG	8.723843	8.839655	2.7654	2.834436	18.09089	18.10478	24.09005	24.05722	107.50628	126.477976	0	8.243333	8.243333
	11	BALLENITA	9.814324	9.944612	3.111075	3.188741	20.35226	20.36788	27.10131	27.06437	120.944565	142.287724	0	9.27375	9.27375
	12	SEASPAN SANTOS	10.9048	11.04957	3.45675	3.543045	22.61362	22.63098	30.11256	30.07153	134.38285	158.097471	0	10.30417	10.30417
	13	ANGUS EXPRESS	18.53817	18.78427	5.876475	6.023177	14.00964	14.12707	17.87293	17.92306	113.154787	133.123279	0	17.51708	17.51708
	14														
	15														

																TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL											2150.72919	2530.26964			248.7426	2362.160386	2779.01222	2220	-559.0122	-25.1807

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Monday, 09 October 2017	1	MERATUS SABANG	37.07633	37.56853	11.75295	12.04635	23.96545	24.21491	30.21793	30.33807	207.18053	243.7418	17.311	35.03417	52.34517
	2	BBC AFRICA	16.35721	16.57435	5.185125	5.314568	17.743	17.82726	23.10872	23.12654	125.236772	147.337379	10.71633	15.45625	26.17258
	3	SPIL NIKEN	9.814324	9.944612	3.111075	3.188741	20.35226	20.36788	27.10131	27.06437	120.944565	142.287724	0	9.27375	9.27375
	4	CITRA KARYA PAPUA	19.62865	19.88922	6.22215	6.377481	14.19565	14.32229	18.05417	18.11038	116.799992	137.411755	0	18.5475	18.5475
	5	MERATUS GORONTALO	13.08577	13.25948	4.1481	4.251654	14.99187	15.0564	19.57443	19.58478	103.952475	122.29703	0	12.365	12.365
	6	MERATUS KARIMATA	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	7	SITU MAS	13.08577	13.25948	4.1481	4.251654	27.13634	27.15717	36.13508	36.08583	161.25942	189.716965	0	12.365	12.365
	8	MARINA STAR 2	19.62865	19.88922	6.22215	6.377481	20.28673	20.39146	26.36019	26.38651	145.542395	171.226347	0	18.5475	18.5475
	9	AYER MAS	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	8.243333	13.39542	21.63875
	10	TOMINI DIGNITY	32.71441	33.14871	10.37025	10.62914	67.84085	67.89294	90.33769	90.21458	403.14855	474.292412	0	30.9125	30.9125
	11	MUTIARA PERSADA 3	8.723843	8.839655	2.7654	2.834436	9.583035	9.627539	12.48842	12.49734	67.359674	79.2466753	0	8.243333	8.243333
	12	BALLENITA	25.08105	25.41401	7.950525	8.149004	52.01132	52.05125	69.25889	69.16451	309.080555	363.624182	0	23.69958	23.69958
	13														
	14														
	16														
	17														
TOTAL											1912.84355	2250.40418			246.4757

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
2122.34787	2496.87985	2080	-416.8798	-20.0423

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Tuesday, 10 October 2017	1	KABOGA BARU	14.17625	14.36444	4.493775	4.605959	5.914437	6.021509	7.123698	7.185578	63.8856404	75.159577	5.770333	13.39542	19.16575
	2	MEDELIN EXPO	22.90009	23.20409	7.259175	7.440395	24.15128	24.27172	31.41277	31.4411	172.080619	202.447787	0	21.63875	21.63875
	3	SPIL NINGSIH	19.62865	19.88922	6.22215	6.377481	34.38496	34.43895	45.58504	45.54218	212.068632	249.492508	0	18.5475	18.5475
	4	TANTO BAGUS	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.039776	4.946	18.5475	23.4935
	5	MERATUS BANJAR 1	10.9048	11.04957	3.45675	3.543045	7.048663	7.122033	8.887625	8.922963	60.93545	71.6887647	0	10.30417	10.30417
	6	LINTAS ASAHAN	18.53817	18.78427	5.876475	6.023177	11.98273	12.10746	15.10896	15.16904	103.590265	121.8709	0	17.51708	17.51708
	7	MERATUS BORNEO	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	11.1285	15.45625	26.58475
	8	MERATUS MALINO	29.44297	29.83383	9.333225	9.566222	28.29237	28.45714	36.6252	36.67517	208.226129	244.971916	0	27.82125	27.82125
	9	AYER MAS	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	1.2365	13.39542	14.63192
	10	GRIYA MELAYU	19.62865	19.88922	6.22215	6.377481	17.79669	17.91037	22.96468	23.00322	133.792469	157.402904	0	18.5475	18.5475
	11	PULAU HOKI	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	12	TIGER SUMMER	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	0	15.45625	15.45625
	13	LAGUN MAS	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.039776	0	18.5475	18.5475
	14														
	15														
TOTAL											1509.0918	1775.40212			244.6209

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1717.019578	2020.02303	2148	127.97697	5.957959

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Wednesday, 11 October 2017	1	NRS 5	22.90009	23.20409	7.259175	7.440395	14.80219	14.95627	18.66401	18.73822	127.964445	150.546406	11.21093	21.63875	32.84968
	2	RELIANCE	20.71913	20.99418	6.567825	6.731786	13.39246	13.53186	16.88649	16.95363	115.777355	136.208653	2.473	19.57792	22.05092
	3	INTAN DAYA	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.702024	7.419	16.48667	23.90567
	4	TANTO HEMAT	11.99528	12.15453	3.802425	3.89735	7.753529	7.834236	9.776388	9.815259	67.028995	78.8576412	0	11.33458	11.33458
	5	WARNOW CHIEF	17.44769	17.67931	5.5308	5.668872	16.08446	16.18455	20.77465	20.8076	120.177927	141.385797	0	16.48667	16.48667
	6	BILITON 15	18.53817	18.78427	5.876475	6.023177	11.98273	12.10746	15.10896	15.16904	103.590265	121.8709	0	17.51708	17.51708
	7	LEGUNDI	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.364271	0	14.42583	14.42583
	8	LAGUN MAS	8.723843	8.839655	2.7654	2.834436	5.63893	5.697626	7.1101	7.13837	48.74836	57.3510118	0	8.243333	8.243333
	9	AYER MAS	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	0	13.39542	13.39542
	10	ISA GLORY	51.25258	51.93297	16.24673	16.65231	38.68128	39.00614	49.34352	49.48236	312.597875	367.762206	0	48.42958	48.42958
	11	TIMUR LAUT MAS	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.702024	8.243333	16.48667	24.73
	12	SPIL NINGSIH	22.90009	23.20409	7.259175	7.440395	26.79728	26.9082	35.02096	35.03631	184.566495	217.137053	0	21.63875	21.63875
	13	MERATUS BENOA	29.44297	29.83383	9.333225	9.566222	19.03139	19.22949	23.99659	24.092	164.525715	193.559665	0	27.82125	27.82125
	14														
	15														
	16														
	17														
TOTAL											1604.49659	1887.64304			282.8288

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1844.90104	2170.47181	1880	-290.4718	-15.4506

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Thursday, 12 October 2017	1	PULAU HOKI	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	14.01367	13.39542	27.40908
	2	AYER MAS	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.841905	64.5198882	0	9.27375	9.27375
	3	SAWU SEA	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	4	MARINA STAR 2	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	5	LUMOSO SELAMAT	8.723843	8.839655	2.7654	2.834436	5.63893	5.697626	7.1101	7.13837	48.74836	57.3510118	0	8.243333	8.243333
	6	PRAKA VENTURE	28.35249	28.72888	8.98755	9.211917	18.32652	18.51728	23.10783	23.1997	158.43217	186.390788	0	26.79083	26.79083
	7	ARMADA SETIA	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.702024	0	16.48667	16.48667
	8	CHILOE ISLAND	15.26673	15.4694	4.83945	4.960263	24.35721	24.40779	32.20051	32.17889	153.680241	180.800283	14.01367	14.42583	28.4395
	9	Tb. DRAKO VALIANT	23.99057	24.30905	7.60485	7.794699	15.50706	15.66847	19.55278	19.63052	134.05799	157.715282	0	22.66917	22.66917
	10	TELUK FLAMINGGO	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	8.243333	20.60833	28.85167
	11	OCEAN SUKSES	21.80961	22.09914	6.9135	7.08609	20.42169	20.54568	26.39939	26.43903	151.714121	178.487201	9.892	20.60833	30.50033
	12														
	13														
	14														
	15														
TOTAL											1146.30357	1348.59244			223.3943

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1336.188755	1571.98677	1840	268.01323	14.56594

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Friday, 13 October 2017	1	ASIA PESONA	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	4.121667	20.60833	24.73
	2	KIRAN ASYA	26.17153	26.51896	8.2962	8.503308	37.03846	37.14214	48.76894	48.75501	241.194551	283.758295	7.419	24.73	32.149
	3	MENTARI EXPRESS	13.08577	13.25948	4.1481	4.251654	9.230632	9.315897	11.7182	11.75682	76.7665468	90.3135845	2.473	12.365	14.838
	4	SINAR SUMBA	18.53817	18.78427	5.876475	6.023177	19.38289	19.48099	25.20009	25.22386	138.50991	162.952836	0	17.51708	17.51708
	5	FATIMA 3	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	0	20.60833	20.60833
	6	TANTO SEMANGAT	28.35249	28.72888	8.98755	9.211917	18.32652	18.51728	23.10783	23.1997	158.43217	186.390788	3.297333	26.79083	30.08817
	7	ORIENTAL MUTIARA	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.364271	1.648667	14.42583	16.0745
	8	BILITON 15	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.702024	0	16.48667	16.48667
	9	SEGARA MAS	16.35721	16.57435	5.185125	5.314568	17.51733	17.6024	22.80099	22.81992	124.171897	146.084584	6.594667	15.45625	22.05092
	10	LEGUNDI	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.841905	64.5198882	0	9.27375	9.27375
	11	HAPPY STAR	8.723843	8.839655	2.7654	2.834436	5.63893	5.697626	7.1101	7.13837	48.74836	57.3510118	0	8.243333	8.243333
	12	ANSAC COLOMBIA	21.80961	22.09914	6.9135	7.08609	18.66091	18.79123	23.99832	24.0466	143.405389	168.712222	0	20.60833	20.60833
	13	LOGISTIC NUSANTARA	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	6.594667	20.60833	27.203
	14														
	15														
	16														
	17														
TOTAL											1534.48978	1805.28209			259.8711

			TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
			1755.380199	2065.15318	2240	174.84682	7.805662

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Saturday, 14 October 2017	1	KOTA JUTA	23.99057	24.30905	7.60485	7.794699	40.26642	40.33874	53.31554	53.27179	250.891652	295.16665	0	22.66917	22.66917
	2	TANTO HEMAT	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	2.473	20.60833	23.08133
	3	LINTAS BARITO	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	9.892	13.39542	23.28742
	4	MERATUS PEKAN BARU	25.08105	25.41401	7.950525	8.149004	23.79348	23.93495	30.78002	30.8241	175.92713	206.973094	0	23.69958	23.69958
	5	PRATAMA 3	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.039776	2.473	18.5475	21.0205
	6	MUTIARA PERSADA	21.80961	22.09914	6.9135	7.08609	17.60943	17.74353	22.56448	22.61792	138.4437	162.874941	0	20.60833	20.60833
	7	SINAR AMBON	21.80961	22.09914	6.9135	7.08609	17.8611	17.99429	22.90767	22.95987	139.631269	164.272081	0	20.60833	20.60833
	8	TELUK BERAU	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	2.060833	20.60833	22.66917
	9	NAJADE	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	2.060833	14.42583	16.48667
	10	MSC IMMA	15.26673	15.4694	4.83945	4.960263	27.18835	27.22874	36.06116	36.02564	167.039722	196.517319	0	14.42583	14.42583
	11	TANTO LESTARI	9.814324	9.944612	3.111075	3.188741	7.514487	7.576307	9.595259	9.621318	60.3661223	71.0189674	0	9.27375	9.27375
	12	LUNA BLUE	15.26673	15.4694	4.83945	4.960263	10.69312	10.79287	13.56767	13.61309	89.2025968	104.944232	0	14.42583	14.42583
	13	MERATUS SABANG	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.841905	64.5198882	0	9.27375	9.27375
	14	NORD PLUTO	16.35721	16.57435	5.185125	5.314568	33.92043	33.94647	45.16884	45.10729	201.574275	237.146206	0	15.45625	15.45625
	15	MERATUS KELIMUTU	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.364271	0	14.42583	14.42583
TOTAL											1984.00569	2334.12434			271.4118

			TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
			2214.705675	2605.53609	2470	-135.5361	-5.48729

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Sunday, 15 October 2017	1	SPIL NIRMALA	15.26673	15.4694	4.83945	4.960263	22.27211	22.33019	29.35719	29.3458	143.841124	169.224852	0	14.42583	14.42583
	2	KARUNIA SEJATRA	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.039776	0	18.5475	18.5475
	3	KOTA JUTA	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	16.48667	14.42583	30.9125
	4	LOGISTIC NUSANTARA	32.71441	33.14871	10.37025	10.62914	21.63394	21.8523	27.32827	27.43189	185.1089	217.775176	0	30.9125	30.9125
	5	MILA UTAMA	16.35721	16.57435	5.185125	5.314568	13.33371	13.43383	17.09605	17.13551	104.430362	122.85925	2.473	15.45625	17.92925
	6	ANUGRAH BUANA 8	9.814324	9.944612	3.111075	3.188741	9.675034	9.72908	12.54146	12.55692	70.5612432	83.0132273	0	9.27375	9.27375
	7	PRATIWI RAYA	14.17625	14.36444	4.493775	4.605959	13.30574	13.38622	17.20275	17.22836	98.763497	116.192349	0	13.39542	13.39542
	8	MAHAKAMAH 1	14.17625	14.36444	4.493775	4.605959	21.41938	21.47066	28.2668	28.2526	137.04985	161.235117	0	13.39542	13.39542
	9	TANTO SUBUR 1	23.99057	24.30905	7.60485	7.794699	41.45593	41.52397	54.9376	54.88801	256.504678	301.77021	0	22.66917	22.66917
	10	SERASI 1	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.702024	4.946	16.48667	21.43267
	11	SEGARA MAS	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	0	14.42583	14.42583
	12	MERATUS BATAM	32.71441	33.14871	10.37025	10.62914	31.09293	31.27724	40.22688	40.28409	229.743636	270.286631	0	30.9125	30.9125
	13	AAMMONIA BOROLINA	23.99057	24.30905	7.60485	7.794699	15.50706	15.66847	19.55278	19.63052	134.05799	157.715282	5.770333	22.66917	28.4395
	14														
	15														
	16														
	17														
TOTAL											1943.51379	2286.48681			266.6718

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
2170.184849	2553.15865	2540	-13.15865	-0.51806

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Monday, 16 October 2017	1	ANSAC COLOMBIA	13.08577	13.25948	4.1481	4.251654	27.13634	27.15717	36.13508	36.08583	161.25942	189.716965	0	12.365	12.365
	2	TANTO BERSINAR	15.26673	15.4694	4.83945	4.960263	23.06305	23.11829	30.43576	30.42048	147.57342	173.615789	0	14.42583	14.42583
	3	LUMOSO GEMBIRA	23.99057	24.30905	7.60485	7.794699	15.50706	15.66847	19.55278	19.63052	134.05799	157.715282	11.54067	22.66917	34.20983
	4	RSP 2	14.17625	14.36444	4.493775	4.605959	23.62474	23.66808	31.27411	31.24909	147.456447	173.478173	0.824333	13.39542	14.21975
	5	NOAH 7	31.62393	32.04375	10.02458	10.27483	20.44112	20.65389	25.77411	25.87659	176.712805	207.897418	0	29.88208	29.88208
	6	NORTHERN VIVACITY	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	7.419	14.42583	21.84483
	7	TANTO RAYA	21.80961	22.09914	6.9135	7.08609	18.67226	18.80254	24.0138	24.06203	143.458968	168.775257	0	20.60833	20.60833
	8	ORIENTAL EMERALD	17.44769	17.67931	5.5308	5.668872	21.41617	21.49708	28.04516	28.05195	145.337026	170.984737	8.243333	16.48667	24.73
	9	TAICHUNG	21.80961	22.09914	6.9135	7.08609	45.22723	45.26196	60.22513	60.14305	268.7657	316.194941	0	20.60833	20.60833
	10	CSCL SANTIAGO	16.35721	16.57435	5.185125	5.314568	33.92043	33.94647	45.16884	45.10729	201.574275	237.146206	4.946	15.45625	20.40225
	11	KOTA NASRAT	16.35721	16.57435	5.185125	5.314568	33.92043	33.94647	45.16884	45.10729	201.574275	237.146206	0	15.45625	15.45625
	12	MENTARI SUCCESS	23.99057	24.30905	7.60485	7.794699	15.50706	15.66847	19.55278	19.63052	134.05799	157.715282	0	22.66917	22.66917
	13														
	14														
	15														
TOTAL											2049.96431	2411.72271			251.4217

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
2263.672723	2663.14438	2170	-493.1444	-22.7255

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Tuesday, 17 October 2017	1	NORTHERN VIVACITY	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	25.55433	14.42583	39.98017
	2	KISIK MAS	20.71913	20.99418	6.567825	6.731786	17.53536	17.65985	22.53589	22.58271	135.326726	159.207912	0	19.57792	19.57792
	3	PEK 246	22.90009	23.20409	7.259175	7.440395	14.80219	14.95627	18.66401	18.73822	127.964445	150.546406	0	21.63875	21.63875
	4	MT. KATO MAS	13.08577	13.25948	4.1481	4.251654	8.936837	9.023159	11.31757	11.35763	75.3801963	88.6825838	12.365	12.365	24.73
	5	PEKAN FAJAR	20.71913	20.99418	6.567825	6.731786	15.89209	16.0225	20.29508	20.34995	127.572537	150.085337	0	19.57792	19.57792
	6	NAVIGATOR ARIES	21.80961	22.09914	6.9135	7.08609	45.22723	45.26196	60.22513	60.14305	268.7657	316.194941	1.648667	20.60833	22.257
	7	CSCL SANTIAGO	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	7.419	14.42583	21.84483
	8	TAICHUNG	8.723843	8.839655	2.7654	2.834436	18.09089	18.10478	24.09005	24.05722	107.50628	126.477976	0	8.243333	8.243333
	9	NEW GLORY	23.99057	24.30905	7.60485	7.794699	38.34657	38.4258	50.69756	50.66323	241.832323	284.508615	0	22.66917	22.66917
	10	DAHLIA	34.89537	35.35862	11.0616	11.33774	22.55572	22.7905	28.4404	28.55348	194.99344	229.404047	3.297333	32.97333	36.27067
	11														
	12														
	13														
	14														
	15														
	16														
	17														
TOTAL											1655.61363	1947.78074			236.7898

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1856.884914	2184.57049	1930	-254.5705	-13.1902

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Wednesday, 18 October 2017	1	NORDWOGE	16.35721	16.57435	5.185125	5.314568	33.92043	33.94647	45.16884	45.10729	201.574275	237.146206	0	15.45625	15.45625
	2	TANTO PERMAI	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	0	14.42583	14.42583
	3	GULF MAS	20.71913	20.99418	6.567825	6.731786	24.14614	24.24685	31.5506	31.56498	166.521488	195.907633	0	19.57792	19.57792
	4	MERATUS MAKASSAR	20.71913	20.99418	6.567825	6.731786	42.96587	42.99886	57.21387	57.1359	255.327415	300.385194	2.885167	19.57792	22.46308
	5	NIRBITA	20.71913	20.99418	6.567825	6.731786	42.96587	42.99886	57.21387	57.1359	255.327415	300.385194	1.2365	19.57792	20.81442
	6	NOAH 7	20.71913	20.99418	6.567825	6.731786	13.39246	13.53186	16.88649	16.95363	115.777355	136.208653	0	19.57792	19.57792
	7	SAVIOUR	26.17153	26.51896	8.2962	8.503308	26.62733	26.76847	34.57194	34.6091	192.066838	225.960986	7.419	24.73	32.149
	8	LENA	17.44769	17.67931	5.5308	5.668872	20.85416	20.93709	27.27879	27.28834	142.685061	167.864778	3.297333	16.48667	19.784
	9	TANTO SENTOSA	26.17153	26.51896	8.2962	8.503308	29.3338	29.4652	38.26258	38.28646	204.838053	240.985944	0	24.73	24.73
	10	SINAR AMBON	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	3.7095	14.42583	18.13533
	11	MILA UTAMA	8.723843	8.839655	2.7654	2.834436	13.907	13.93595	18.38474	18.37244	87.7634695	103.251141	0	8.243333	8.243333
	12	SPIL CITRA	18.53817	18.78427	5.876475	6.023177	38.44315	38.47266	51.19136	51.12159	228.450845	268.7657	0	17.51708	17.51708
	13	TELUK FLAMINGGO	16.35721	16.57435	5.185125	5.314568	16.43046	16.51944	21.3189	21.34316	119.043212	140.050838	0	15.45625	15.45625
	14														
	15														
TOTAL											2345.64741	2759.58518			248.3304

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
2556.728261	3007.9156	2288	-719.9156	-31.4648

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Thursday, 19 October 2017	1	DONGHAI STAR	14.17625	14.36444	4.493775	4.605959	29.3977	29.42027	39.14633	39.09298	174.697705	205.526712	3.7095	13.39542	17.10492
	2	TANTO HORAS	27.26201	27.62392	8.641875	8.857613	56.53404	56.57745	75.28141	75.17881	335.957125	395.243676	0	25.76042	25.76042
	3	KATOMAS	27.26201	27.62392	8.641875	8.857613	20.82324	20.99514	26.58485	26.65749	167.446133	196.995451	0	25.76042	25.76042
	4	TANTO HANDAL	15.26673	15.4694	4.83945	4.960263	25.54404	25.59035	33.81891	33.79147	159.280601	187.388942	0	14.42583	14.42583
	5	TANTO STAR	30.53345	30.93879	9.6789	9.920526	54.368	54.44882	72.11046	72.03947	334.038409	392.986363	0	28.85167	28.85167
	6	FATIMAH 3	9.814324	9.944612	3.111075	3.188741	7.185939	7.248941	9.147238	9.17491	58.815779	69.1950341	2.885167	9.27375	12.15892
	7	NORTHERN DEMOCRAT	28.35249	28.72888	8.98755	9.211917	58.7954	58.84054	78.29266	78.18597	349.39541	411.053424	0	26.79083	26.79083
	8	STAR HIDRA	18.53817	18.78427	5.876475	6.023177	38.44315	38.47266	51.19136	51.12159	228.450845	268.7657	0	17.51708	17.51708
	9	MARINA STAR 2	8.723843	8.839655	2.7654	2.834436	18.09089	18.10478	24.09005	24.05722	107.50628	126.477976	0	8.243333	8.243333
	10	MUTIARA BENOA	20.71913	20.99418	6.567825	6.731786	16.60083	16.72868	21.26153	21.31293	130.916896	154.019878	0	19.57792	19.57792
	11	MUTIARA PERSADA 3	13.08577	13.25948	4.1481	4.251654	27.13634	27.15717	36.13508	36.08583	161.25942	189.716965	0	12.365	12.365
	12	TANTO BERKAT	19.62865	19.88922	6.22215	6.377481	28.64762	28.72226	37.7614	37.74669	184.995465	217.641724	0	18.5475	18.5475
	13	MS HAWK	11.99528	12.15453	3.802425	3.89735	24.87498	24.89408	33.12382	33.07868	147.821135	173.907218	0	11.33458	11.33458
	14	NAVIGATOR GLOBAL	33.80489	34.25366	10.71593	10.98344	70.10221	70.15603	93.34894	93.22173	416.586835	490.102159	0	31.94292	31.94292
	15	KAWA MAS	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.039776	2.060833	18.5475	20.60833
	16	KMTC CENNAI	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	0	14.42583	14.42583

																TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL											3254.98784	3829.39746			305.4155	3514.591014	4134.81296	2770	-1364.813	-49.2712

BOLLARD PULL REQUIRED			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Friday, 20 October 2017	1	ARMADA SEJATI	21.80961	22.09914	6.9135	7.08609	30.95433	31.04041	40.76207	40.75003	201.415181	236.959036	14.838	20.60833	35.44633
	2	SWARNA BAHTERA	17.44769	17.67931	5.5308	5.668872	31.10574	31.15178	41.25821	41.21746	191.059864	224.776311	0	16.48667	16.48667
	3	LAGUN MAS	15.26673	15.4694	4.83945	4.960263	12.96472	13.0563	16.66531	16.69959	99.9217514	117.555002	8.243333	14.42583	22.66917
	4	SENDANG MAS	15.26673	15.4694	4.83945	4.960263	31.65906	31.68337	42.15759	42.10014	188.13599	221.336459	0	14.42583	14.42583
	5	PALUNG MAS	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.841905	64.5198882	0	9.27375	9.27375
	6	SELATAN DAMAI	16.35721	16.57435	5.185125	5.314568	17.45482	17.54011	22.71574	22.73498	123.876903	145.737533	0	15.45625	15.45625
	7	WAN HAI 281	17.44769	17.67931	5.5308	5.668872	36.18179	36.20957	48.1801	48.11444	215.01256	252.955953	4.121667	16.48667	20.60833
	8	MERATUS KAMPAR	30.53345	30.93879	9.6789	9.920526	25.19338	25.37918	32.32688	32.39905	196.37015	231.023706	0	28.85167	28.85167
	9	NORTHERN DEMOCRATION	13.08577	13.25948	4.1481	4.251654	27.13634	27.15717	36.13508	36.08583	161.25942	189.716965	0	12.365	12.365
	10	NIRBITA	9.814324	9.944612	3.111075	3.188741	20.35226	20.36788	27.10131	27.06437	120.944565	142.287724	0	9.27375	9.27375
	11	SOPHIA	22.90009	23.20409	7.259175	7.440395	29.87943	29.97925	39.22388	39.22411	199.110414	234.247546	0	21.63875	21.63875
	12	KIRAN ASYA	45.80018	46.40819	14.51835	14.88079	94.97719	95.05011	126.4728	126.3004	564.40797	664.009376	0	43.2775	43.2775
	13														
	14														
	15														

																TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL											2316.35667	2725.1255			249.773	2528.663724	2974.8985	2170	-804.8985	-37.0921

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Saturday, 21 October 2017	1	NEW LIFE	23.99057	24.30905	7.60485	7.794699	49.74996	49.78815	66.24764	66.15736	295.64227	347.814435	0	22.66917	22.66917
	2	MUARA MAS	26.17153	26.51896	8.2962	8.503308	16.91679	17.09288	21.3303	21.41511	146.24508	172.053035	3.297333	24.73	28.02733
	3	RORO PRAYASTI	13.08577	13.25948	4.1481	4.251654	24.20305	24.23444	32.13514	32.10028	147.417914	173.43284	0	12.365	12.365
	4	MERATUS DILI	15.26673	15.4694	4.83945	4.960263	10.8486	10.94779	13.77968	13.82434	89.9362341	105.807334	0	14.42583	14.42583
	5	MERATUS PALEMBANG	23.99057	24.30905	7.60485	7.794699	18.19973	18.35145	23.2246	23.28913	146.764073	172.663615	0	22.66917	22.66917
	6	TANTO DAMAI	13.08577	13.25948	4.1481	4.251654	14.49518	14.5615	18.89713	18.90991	101.608727	119.539679	4.946	12.365	17.311
	7	SINAR SABANG	17.44769	17.67931	5.5308	5.668872	36.18179	36.20957	48.1801	48.11444	215.01256	252.955953	0	16.48667	16.48667
	8	NEW LIFE	9.814324	9.944612	3.111075	3.188741	13.61191	13.65179	17.90993	17.90607	89.1384395	104.868752	0	9.27375	9.27375
	9	MERATUS KAMPAR	15.26673	15.4694	4.83945	4.960263	10.51358	10.61398	13.32284	13.36915	88.3553841	103.947511	0	14.42583	14.42583
	10	KANAL MAS	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	0	13.39542	13.39542
	11	MERATUS KARIMATA	11.99528	12.15453	3.802425	3.89735	10.30072	10.37227	13.24984	13.27621	79.0486177	92.9983738	0	11.33458	11.33458
	12	PULAU NUNUKAN	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.841905	64.5198882	0	9.27375	9.27375
	13	ISA WINTER	26.17153	26.51896	8.2962	8.503308	37.00762	37.11141	48.72689	48.71311	241.049039	283.587104	0	24.73	24.73
	14		0	0	0	0	0	0	0	0	0	0	0	0	0
	15		0	0	0	0	0	0	0	0	0	0	0	0	0
	16		0	0	0	0	0	0	0	0	0	0	0	0	0
	17														

	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL	1958.205703	2303.77142	2160	-143.7714	-6.65608

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Sunday, 22 October	1	RELIANCE	16.35721	16.57435	5.185125	5.314568	11.07227	11.18053	14.01227	14.06283	93.7591511	110.304884	22.257	15.45625	37.71325
	2	SOPHIA	25.08105	25.41401	7.950525	8.149004	21.26535	21.41591	27.33257	27.38905	163.997462	192.93819	0	23.69958	23.69958
	3	ARMADA PURNAMA	19.62865	19.88922	6.22215	6.377481	21.36153	21.46238	27.82582	27.84686	150.614085	177.193041	4.121667	18.5475	22.66917
	4	SPIL HAYU	15.26673	15.4694	4.83945	4.960263	11.33291	11.43036	14.44011	14.48239	92.2216117	108.496014	0	14.42583	14.42583
	5	MERATUS KENDARI	13.08577	13.25948	4.1481	4.251654	9.466438	9.550855	12.03975	12.07721	77.8792604	91.6226593	0	12.365	12.365
	6	SIN HUAT HUAT 1	33.80489	34.25366	10.71593	10.98344	21.85085	22.0783	27.55164	27.66118	188.899895	222.235171	0	31.94292	31.94292
	7	MERATUS MEDAN 1	21.80961	22.09914	6.9135	7.08609	32.50273	32.58324	42.87353	42.85389	208.72173	245.554976	14.42583	20.60833	35.03417
	8	TANTO SENTOSA	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.364271	5.770333	14.42583	20.19617
	9	KANAL MAS	23.99057	24.30905	7.60485	7.794699	15.50706	15.66847	19.55278	19.63052	134.05799	157.715282	0	22.66917	22.66917
	10	TANTO HARMONI	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	4.121667	12.365	16.48667
	11	IRIS MANDIRI	28.35249	28.72888	8.98755	9.211917	18.32652	18.51728	23.10783	23.1997	158.43217	186.390788	0	26.79083	26.79083
	12														
	13														
	14														
	15														

	TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
TOTAL	1651.409362	1942.83454	2160	217.16546	10.05396

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Monday, 23 October 2017	1	ST AYLON	21.80961	22.09914	6.9135	7.08609	32.30129	32.38253	42.59884	42.58019	207.77119	244.436694	9.067667	20.60833	29.676
	2	DARMA KARTIKA 9	21.80961	22.09914	6.9135	7.08609	17.00335	17.13963	21.73801	21.79443	135.583758	159.510304	2.473	20.60833	23.08133
	3	MERATUS KENDARI 1	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	7.419	20.60833	28.02733
	4	TANTO SENANG	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	15.66233	15.45625	31.11858
	5	COUGAR	19.62865	19.88922	6.22215	6.377481	17.35723	17.47249	22.36541	22.4061	131.718736	154.963219	0	18.5475	18.5475
	6	SAWU SEA	26.17153	26.51896	8.2962	8.503308	16.91679	17.09288	21.3303	21.41511	146.24508	172.053035	0	24.73	24.73
	7	KANAL MAS	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.039776	0	18.5475	18.5475
	8	TRANS PASIFIK 06	29.44297	29.83383	9.333225	9.566222	19.03139	19.22949	23.99659	24.092	164.525715	193.559665	0	27.82125	27.82125
	9	PEDHOULAS FARMER	23.99057	24.30905	7.60485	7.794699	49.74996	49.78815	66.24764	66.15736	295.64227	347.814435	6.594667	22.66917	29.26383
	10														
	11														
	12														
	13														
	14														
	15														
	16														
	17														
TOTAL											1404.44463	1652.2878			230.8133

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1600.635967	1883.10114	2020	136.89886	6.777171

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Tuesday, 24 October 2017	1	TANTO SENTOSA	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.364271	16.48667	14.42583	30.9125
	2	SINAR PAPUA	18.53817	18.78427	5.876475	6.023177	11.98273	12.10746	15.10896	15.16904	103.590265	121.8709	0	17.51708	17.51708
	3	DHAMA KARTIKA IX	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.364271	0	14.42583	14.42583
	4	ANTHOS	22.90009	23.20409	7.259175	7.440395	27.56914	27.67728	36.07349	36.08505	188.208715	221.422018	0	21.63875	21.63875
	5	DARYA LOK	43.61922	44.19827	13.827	14.17218	56.68614	56.8771	74.40253	74.40408	378.186513	444.92531	0	41.21667	41.21667
	6	MERATUS PALEMBANG	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	5.770333	13.39542	19.16575
	7	SPIL CAYA	27.26201	27.62392	8.641875	8.857613	33.67313	33.7988	44.10744	44.11702	228.081802	268.331531	0	25.76042	25.76042
	8	SERASI 2	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.364271	3.297333	14.42583	17.72317
	9	TELUK BERAU	20.71913	20.99418	6.567825	6.731786	13.39246	13.53186	16.88649	16.95363	115.777355	136.208653	0	19.57792	19.57792
	10	TANTO TERANG	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.364271	0	14.42583	14.42583
	11	MERATUS ULTIMA	18.53817	18.78427	5.876475	6.023177	11.98273	12.10746	15.10896	15.16904	103.590265	121.8709	0	17.51708	17.51708
	12	MSC IMMA	17.44769	17.67931	5.5308	5.668872	19.33045	19.41887	25.20101	25.21804	135.495034	159.405923	0	16.48667	16.48667
	13	ORIENTAL GALAXY	17.44769	17.67931	5.5308	5.668872	12.53128	12.64416	15.9294	15.97979	103.411299	121.660352	0	16.48667	16.48667
	14	MENTARI SEMANGAT	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.702024	0	16.48667	16.48667
	15														
TOTAL											1874.29257	2205.05009			289.341

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
2120.232423	2494.39109	2650	155.60891	5.872034

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Wednesday, 25 October 2017	1	MERATUS MEDAN 1	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	2	STAR OF LUCK	10.9048	11.04957	3.45675	3.543045	7.048663	7.122033	8.887625	8.922963	60.93545	71.6887647	0	10.30417	10.30417
	3	MERATUS BONTANG	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	0	13.39542	13.39542
	4	SITU MAS	7.633363	7.734698	2.419725	2.480132	4.934064	4.985423	6.221338	6.246074	42.654815	50.1821353	0	7.212917	7.212917
	5	CAPE MORETON	38.16681	38.67349	12.09863	12.40066	29.65207	29.89094	37.89999	37.99923	236.781815	278.566841	0	36.06458	36.06458
	6	DOROLONDA	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	3.7095	12.365	16.0745
	7	WARNOW CHIEF	22.90009	23.20409	7.259175	7.440395	14.80219	14.95627	18.66401	18.73822	127.964445	150.546406	0	21.63875	21.63875
	8	MERATUS GORONTALO	18.53817	18.78427	5.876475	6.023177	11.98273	12.10746	15.10896	15.16904	103.590265	121.8709	0	17.51708	17.51708
	9	TAL STAR	23.99057	24.30905	7.60485	7.794699	15.50706	15.66847	19.55278	19.63052	134.05799	157.715282	1.648667	22.66917	24.31783
	10	TRANS PASIFIK 06	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	0	15.45625	15.45625
	11	MENTARI SEMANGAT	33.80489	34.25366	10.71593	10.98344	21.85085	22.0783	27.55164	27.66118	188.899895	222.235171	0	31.94292	31.94292
	12	INTAN DAYA 11	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.702024	1.648667	16.48667	18.13533
	13	MENTARI SUKSES	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	0	20.60833	20.60833
	14	TANTO CERIA	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	0	15.45625	15.45625
	15	MERATUS AMBON	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	0	15.45625	15.45625
	16														
	17														
TOTAL											1613.92298	1898.73292			275.9456

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1848.47673	2174.67851	2680	505.32149	18.85528

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Thursday, 26 October 2017	1	KAMILA	15.95825	16.1701	7.01406	7.18916	14.30238	14.45125	18.05965	18.13146	111.276313	130.913309	10.71633	18.5475	29.26383
	2	SPIL NINGSIH	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	3	WARNOW CHIEF	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	0	15.45625	15.45625
	4	EAST GATE	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	4.533833	13.39542	17.92925
	5	CAPE MORETON	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	6	EVER ALLY	18.53817	18.78427	5.876475	6.023177	11.98273	12.10746	15.10896	15.16904	103.590265	121.8709	0	17.51708	17.51708
	7	WHITE MIYAGI	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	2.885167	20.60833	23.4935
	8	SINAR JEPARA	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	6.594667	13.39542	19.99008
	9	PONA	27.26201	27.62392	8.641875	8.857613	17.62166	17.80508	22.21906	22.30741	152.338625	179.221912	0	25.76042	25.76042
	10	PRATIWI RAYA	30.53345	30.93879	9.6789	9.920526	19.73626	19.94169	24.88535	24.9843	170.61926	200.728541	2.473	28.85167	31.32467
	11	KABONGA BARU 2	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	4.533833	13.39542	17.92925
	12	ORIENTAL GALAXY	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.841905	64.5198882	0	9.27375	9.27375
	13	PALUNG MAS	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.841905	64.5198882	0	9.27375	9.27375
	14	LOUDS ISLAND	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	0	20.60833	20.60833
	15														
TOTAL											1366.54658	1607.70186			262.5502

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1589.714224	1870.25203	2446	575.74797	23.53835

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
	1	MENTARI SENTOSA	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	0	15.45625	15.45625
	2	MENTARI PRATAMA	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.039776	0	18.5475	18.5475
	3	OCEAN BRIDGE	30.53345	30.93879	9.6789	9.920526	19.73626	19.94169	24.88535	24.9843	170.61926	200.728541	0	28.85167	28.85167
	4	LUMOSO SELAMAT	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.364271	2.060833	14.42583	16.48667
	5	VALERIE SCHULTE	11.99528	12.15453	3.802425	3.89735	7.753529	7.834236	9.776388	9.815259	67.028995	78.8576412	0	11.33458	11.33458
	6	HOSANA 7	8.723843	8.839655	2.7654	2.834436	5.63893	5.697626	7.1101	7.13837	48.74836	57.3510118	0	8.243333	8.243333
Friday, 27 October 2017	7	PRATAMA 7	10.9048	11.04957	3.45675	3.543045	7.048663	7.122033	8.887625	8.922963	60.93545	71.6887647	0	10.30417	10.30417
	8	LEGUNDI	18.53817	18.78427	5.876475	6.023177	11.98273	12.10746	15.10896	15.16904	103.590265	121.8709	0	17.51708	17.51708
	9	HAI PHUONG SKY	20.71913	20.99418	6.567825	6.731786	13.39246	13.53186	16.88649	16.95363	115.777355	136.208653	4.533833	19.57792	24.11175
	10	SINAR JEPARA	20.71913	20.99418	6.567825	6.731786	13.39246	13.53186	16.88649	16.95363	115.777355	136.208653	7.006833	19.57792	26.58475
	11	MERATUS ULTIMA 2	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	3.7095	15.45625	19.16575
	12	MSC GIANNA	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	0	15.45625	15.45625
	13	MARINA STAR	26.17153	26.51896	8.2962	8.503308	16.91679	17.09288	21.3303	21.41511	146.24508	172.053035	0	24.73	24.73
	14	SINAR SUMBA	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.039776	0	18.5475	18.5475
	15	MERATUS ULTIMA 1	23.99057	24.30905	7.60485	7.794699	15.50706	15.66847	19.55278	19.63052	134.05799	157.715282	0	22.66917	22.66917
	16														
	17														
TOTAL											1541.66689	1813.72575			278.0064

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1777.972339	2091.73216	2630	538.26784	20.46646

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Saturday, 28 October 2017	1	LOUDS ISLAND	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.364271	11.54067	14.42583	25.9665
	2	TELUK FLAMINGGO	26.17153	26.51896	8.2962	8.503308	16.91679	17.09288	21.3303	21.41511	146.24508	172.053035	0	24.73	24.73
	3	SUNGAI MAS	20.71913	20.99418	6.567825	6.731786	13.39246	13.53186	16.88649	16.95363	115.777355	136.208653	4.121667	19.57792	23.69958
	4	KOTA JUTA	22.90009	23.20409	7.259175	7.440395	14.80219	14.95627	18.66401	18.73822	127.964445	150.546406	0	21.63875	21.63875
	5	SANTIKA NUSANTARA	8.723843	8.839655	2.7654	2.834436	5.63893	5.697626	7.1101	7.13837	48.74836	57.3510118	0	8.243333	8.243333
	6	HONGKONG BRIDGE	17.44769	17.67931	5.5308	5.668872	14.43863	14.54464	18.53034	18.57137	112.411643	132.248991	0	16.48667	16.48667
	7	SURPLUS	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	8	MSC GIANNA	23.99057	24.30905	7.60485	7.794699	15.50706	15.66847	19.55278	19.63052	134.05799	157.715282	0	22.66917	22.66917
	9	SINAR SABANG	23.99057	24.30905	7.60485	7.794699	15.50706	15.66847	19.55278	19.63052	134.05799	157.715282	10.71633	22.66917	33.3855
	10	TANTO EXPRESS	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.702024	4.121667	16.48667	20.60833
	11	MAGELAN	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	12	OCEAN BRIDGE	28.35249	28.72888	8.98755	9.211917	18.32652	18.51728	23.10783	23.1997	158.43217	186.390788	0	26.79083	26.79083
	13														
	14														
	15														
TOTAL											1306.74646	1537.34878			248.9487

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1518.352829	1786.29745	2330	543.70255	23.33487

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Monday, 29 October 2017	1	CUCKOO HUNTER	13.08577	13.25948	4.1481	4.251654	14.01593	14.08398	18.24361	18.25874	99.3472543	116.879123	0	12.365	12.365
	2	ARMADA PURNAMA	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	3	PULAU NUNUKAN	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	0	20.60833	20.60833
	4	TB. CUMAWUS	37.07633	37.56853	11.75295	12.04635	23.96545	24.21491	30.21793	30.33807	207.18053	243.7418	0	35.03417	35.03417
	5	PEKAN FAJAR	25.08105	25.41401	7.950525	8.149004	16.21192	16.38067	20.44154	20.52281	140.151535	164.884159	0	23.69958	23.69958
	6	ORIENTAL DIAMOND	30.53345	30.93879	9.6789	9.920526	24.17331	24.36278	30.93588	31.01306	191.556703	225.360828	4.946	28.85167	33.79767
	7	MERATUS KAMPAR	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	8	SLAMET 6	16.35721	16.57435	5.185125	5.314568	10.57299	10.68305	13.33144	13.38444	91.403175	107.533147	0	15.45625	15.45625
	9	SINAR AMBON	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.841905	64.5198882	0	9.27375	9.27375
	10	MARINA STAR 1	9.814324	9.944612	3.111075	3.188741	6.343796	6.409829	7.998863	8.030666	54.841905	64.5198882	0	9.27375	9.27375
	11	KOTA JUTA	8.723843	8.839655	2.7654	2.834436	5.63893	5.697626	7.1101	7.13837	48.74836	57.3510118	0	8.243333	8.243333
	12	HONGKONG BRIDGE	11.99528	12.15453	3.802425	3.89735	14.32444	14.38151	18.73673	18.74335	98.0356119	115.336014	0	11.33458	11.33458
	13	TANTO SEMANGAT	23.99057	24.30905	7.60485	7.794699	15.50706	15.66847	19.55278	19.63052	134.05799	157.715282	0	22.66917	22.66917
	14	URU BHUM	13.08577	13.25948	4.1481	4.251654	10.63455	10.71476	13.63263	13.66436	83.391295	98.1074059	11.54067	12.365	23.90567
	15	NAVIGATOR GLOBAL	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	0	13.39542	13.39542
	16	MITRA KENDARI	13.08577	13.25948	4.1481	4.251654	8.458395	8.546439	10.66515	10.70756	73.12254	86.0265176	0	12.365	12.365
	17	LAGUN MAS	20.71913	20.99418	6.567825	6.731786	13.39246	13.53186	16.88649	16.95363	115.777355	136.208653	0	19.57792	19.57792
	18	LUMOSO SELAMAT	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL											1739.78822	2046.80968			295.7296

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1991.158371	2342.53926	2600	257.46074	9.902336

BOLLARD PULL REQUIRED			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Sunday, 30 October 2017	1	FELYA	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	0	20.60833	20.60833
	2	CHUKO HUNTER	23.99057	24.30905	7.60485	7.794699	35.48657	35.57609	46.79757	46.77728	228.336681	268.631389	0	22.66917	22.66917
	3	SINAR AMBON	15.26673	15.4694	4.83945	4.960263	9.868128	9.970846	12.44268	12.49215	85.30963	100.364271	8.243333	14.42583	22.66917
	4	NOTHERN DEFENDER	21.80961	22.09914	6.9135	7.08609	31.55652	31.64044	41.58325	41.56825	204.256795	240.302112	0	20.60833	20.60833
	5	DUTA KAPUAS	32.71441	33.14871	10.37025	10.62914	21.14599	21.3661	26.66288	26.76889	182.80635	215.066294	0	30.9125	30.9125
	6	ISA EXPRESS	14.17625	14.36444	4.493775	4.605959	17.89472	17.95868	23.46045	23.46354	120.417807	141.668009	9.892	13.39542	23.28742
	7	ARMADA PERMATA	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	0	20.60833	20.60833
	8	SPIL CAYA	32.71441	33.14871	10.37025	10.62914	35.65792	35.82581	46.45187	46.48667	251.284764	295.629134	0	30.9125	30.9125
	9	MENTARI PRAKARSA	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	0	13.39542	13.39542
	10	MUTIARA FERINDO	19.62865	19.88922	6.22215	6.377481	12.68759	12.81966	15.99773	16.06133	109.68381	129.039776	0	18.5475	18.5475
	11	TIGA RODA	21.80961	22.09914	6.9135	7.08609	14.09733	14.24407	17.77525	17.84593	121.8709	143.377529	8.243333	20.60833	28.85167
	12														
	13														
	14														
TOTAL											1626.92462	1914.02897			253.0703

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
1842.034406	2167.0993	2310	142.9007	6.186177

			FOC (BASED ON OPERATING MODES)										FOC GENERATOR		
DATE	NO	SHIP NAME	LOITERING		WAITING		LOW ASSIST		HIGH ASSIST		TOTAL (kg)	TOTAL (L)	QUAY	SERVICE	TOTAL
			SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)	SB (kg)	PS (kg)			AE 1	AE 1	L
Tuesday, 31 October 2017	1	AS CONSTANTINA	16.35721	16.57435	5.185125	5.314568	29.52086	29.56273	39.16943	39.12946	180.813732	212.722038	0	15.45625	15.45625
	2	DARWIN	19.62865	19.88922	6.22215	6.377481	40.70451	40.73576	54.20261	54.12875	241.88913	284.575447	0	18.5475	18.5475
	3	RORO SAWITRI	17.44769	17.67931	5.5308	5.668872	11.27786	11.39525	14.2202	14.27674	97.49672	114.702024	0	16.48667	16.48667
	4	DA CHENG	14.17625	14.36444	4.493775	4.605959	9.163261	9.258642	11.55391	11.59985	79.216085	93.1953941	4.121667	13.39542	17.51708
	5	AS SAVONIA	17.44769	17.67931	5.5308	5.668872	20.6436	20.72729	26.99166	27.00225	141.69147	166.695847	0	16.48667	16.48667
	6	MERATUS SABANG	8.723843	8.839655	2.7654	2.834436	5.63893	5.697626	7.1101	7.13837	48.74836	57.3510118	0	8.243333	8.243333
	7	HIJAU JELITA	22.90009	23.20409	7.259175	7.440395	14.80219	14.95627	18.66401	18.73822	127.964445	150.546406	0	21.63875	21.63875
	8	ORIENTAL MUTIARA	22.90009	23.20409	7.259175	7.440395	24.02848	24.14936	31.24531	31.27425	171.501147	201.766055	0	21.63875	21.63875
	9	NORTHERN DEFENDER	22.90009	23.20409	7.259175	7.440395	47.4886	47.52505	63.23638	63.1502	282.203985	332.004688	6.594667	21.63875	28.23342
	10	MUTIARA FERINDO 1	14.17625	14.36444	4.493775	4.605959	9.598042	9.691858	12.14679	12.1906	81.267713	95.6090741	16.48667	13.39542	29.88208
	11	MENTARI TRADER	19.62865	19.88922	6.22215	6.377481	13.4194	13.54884	16.99565	17.05566	113.137053	133.102415	4.946	18.5475	23.4935
	12	MERATUS GORONTALO	18.53817	18.78427	5.876475	6.023177	17.01551	17.12213	21.97184	22.00722	127.338786	149.810336	0	17.51708	17.51708
	13	AS CONSTANTINA	17.44769	17.67931	5.5308	5.668872	36.18179	36.20957	48.1801	48.11444	215.01256	252.955953	0	16.48667	16.48667
	14	AS SAVONIA	19.62865	19.88922	6.22215	6.377481	23.22405	23.3182	30.36562	30.37753	159.402904	187.532828	0	18.5475	18.5475
	15														
	16														
	17														
TOTAL											2067.68409	2432.56952			270.1753

TOTAL (kg)	TOTAL (L)	LOH	MARGIN	%
2297.333052	2702.74477	2330	-372.7448	-15.9976

ATTACHMENT 2
SOFTWARE DESIGN REPORT

Software Design Description
Tugboat Daily Report

Bachelor Degree Program-Marine Engineering
2 June 2018

Prepared by :

Panji Kresno W.
Institut Teknologi Sepuluh Nopember Surabaya

Abstrack:

This document contains a description of software design Tugboat Daily Report which is an information system with a website platform that presents and collects data related to tugboat operating in PT. Pelabuhan Indonesia III.

TABLE OF CONTENT

CHAPTER I INTRODUCTION

1.1 Goal

Software Design Description Document (DPPL) aims to define the design of Tugboat Daily Report software to be developed. DPPL documents are used by software developers as a reference for implementation at a later stage.

1.2 Scope

Tugboat Daily Report is an information system intended for PT. Pelabuhan Indonesia III in monitoring tugboat fuel owned by PT. Pelabuhan Indonesia III. This information system divides the users who can access into two namely, crew and superintendent.

1.3 Definition

In order to provide the same description of some of the definitions and terms used in this document, it will be explained as the following table 1:

Table 1. Definitions and or acronyms of keywords or phrases

Keyword	Definition
AL	*Area Longitudinal* The area of the ship exposed to winds that affect the size of the wind force on vessel
Bollard Pull	*Bollard Pull* Conventional measure of the pulling (or towing) power of a watercraft. It is defined as the force (in tons or kilonewtons (kN)) exerted by a vessel under full power, on a shore-mounted bollard through a tow-line, commonly measured in a practical test (but sometimes simulated) under test conditions that include calm water, no tide, level trim, and sufficient depth and side clearance for a free propeller stream.
B	*Breadth*
CB	*Coefficient Block*
CSS	*Cascading Style Sheet*
DBMS	*Database Management System*

DPPL	*Deskripsi Perancangan Perangkat Lunak*
Engine Load	*Engine Load*
FCurrent	*Current Force*
Fmoor	*Moor Force*
FWind	*Wind Force*
GUI	*Graphic User Interface*
HTML	*Hyper Text Markup Language*
H wave	*High Wave*
IEEE	*Institute of Electrical and Electronics Engineers*
Javascript	*a lightweight, interpreted, object-oriented language with first-class functions, and is best known as the scripting language for Web pages, but it's used in many non-browser environments as well. It is a prototype-based, multi-paradigm scripting language that is dynamic, and supports object-oriented, imperative, and functional programming styles.*
LOA	*Length Overall*
LBP/LPP	*Length Between Perpendicular*
Location from	Initial location
Location to	Destination
Loitering	The condition in which the tugboat approaches when it will be pushed or pulled
Low Assist	Conditions in which the tugboat pushes or pulls the ship with a calculated ½ bollard pull capacity
Operation Time	The whole tugboat time starts to operate
PHP	*Hypertext Preprocessor* A scripting language that can be embedded or inserted into HTML. PHP is widely used to program dynamic websites
Quay	As the tugboat rests in the harbor
Service	The time when pushing the ship
Service Time	The time when tugboat pull or push the ship

SKPL	*Spesifikasi Kebutuhan Perangkat Lunak* Document results analysis that contains the user requirements specification
SRS	*Software Requirement Specification* Document results of a software analysis that contains user requirements specifications
T	*Draught* Vertical distance between water line up to vessel area. The more the boat loads, the deeper the ship enters the water
Transit	The time of loitering
Tug	Tugs that are operating simultaneously
Tugboat Daily Report	*Tugboat Daily Report* System's name
Use Case Diagram	Describes a set of use cases and actors accompanied by relationships between them. The use cases diagrams explain and explain the needs or requirements desired or desired user or user
User	The people using the system
V Wind	*Velocity of Wind*
V Current	*Velocity of Current*
Waiting	The condition in which the tugboat has reached the ship that will be pushed or withdrawn but usually waiting for the directed pilot's orders

1.4 Numbering Rules

There are several things / sections in this document that need to be numbered. The purpose of this numbering is to make it easier for the reader to identify. The numbering rules as shown in table 2 below:

Table 2. Numbering Rules

Section	Numbering Rules
Tabel/Data Store	Number shaped Table X, where X is the serial number of the table or data store
Picture	Y-shaped number where Y is the serial number of the image

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CHAPTER II SYSTEM DESIGN

2.1 Actor

2.1.1 Crew

Crew is one of the actors in the Tugboat Daily Report website. The actor is an authorized actor and has access to run or stop the ship's engine work, giving orders to bind or remove ropes tied to tugboats, as well as entering ship-laden data.

2.1.2 Superintendent

Superintendent is one of the actors in the Tugboat Daily Report website. The actor is an authorized actor and has access to fill data on ship dimensions, receive and manage data from crew actors, view daily reports and fuel calculations, and print reports when needed.

*Note: both actors above can only enter into the system after getting user account from admin.

2.2 Functional Requirement

- System can access between user roles.
  - The system can display different functions for each user role.
  - System can only accept access with username and password which have been registered through admin.
- The system can display a tracking map of tugboats for all user roles
- The system performs data calculations related to the tugboat fuel required to operate within a day
  - Users (crews) can start and stop ship engine work that may affect fuel requirements.
  - The user (superintendent) may enter tugboat-related data that may affect fuel requirements.
  - The system can display the calculation of tugboat fuel requirements within a day.

- System performs tugboat data input function
  - Users (crew) can enter boat-laden data.
  - The user (superintendent) can enter the ship dimension data.
- The system can take into account the time of tugboat in reaching one location to another
  - The user (crew) can start or stop the ship engine work, so the system can calculate the length of tugboat operation time.
  - The user (crew) can give commands to bind or untie the ropes of a drawn or driven vessel, so the system can calculate the length of time the tugboat pulls or pushes the ship.
- The system can print reports
  - The user (superintendent) can choose which report to print.
  - The user (superintendent) can choose the format of report document to be printed.
  - The system will display the print report function.

2.3 Non Functional Requirement

- Accessibility

The display of a system designed to be responsive adjusts the size and shape of the screen of the device so that the system can be accessed easily through any device, either through a computer or via a handheld device

- Security

The system carries the Advanced Encryption Standard (AES) encryption method used to protect and hide the user's original password

- Integrity

The numbers displayed in the uniform counts use two digits behind the comma to avoid causing ambiguity and errors in the data

2.4 Business Use Case

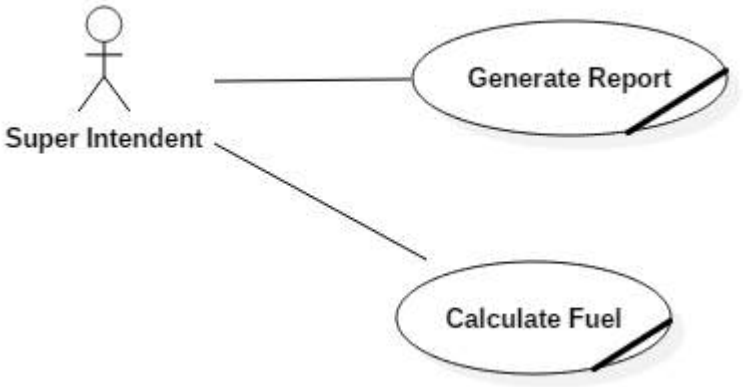

Figure 1. Business Use Case Super Intendent

Business Use Case The above diagram is a business user case user "superintendent" on the Tugboat Daily Report website. Based on the business use case diagram, "superintendent" users can only generate reports and fuel calculations from tugboats.

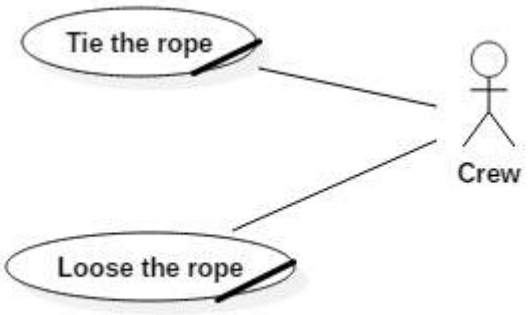

Figure 2. Business Use Case Crew

Business Use Case The above diagram is a business use case of user "crew" on Tugboat Daily Report website. Based on the business use case diagram, user "crew" can only tie the rope and remove the rope of the vessel to be pulled or pushed by the tugboat.

2.5 Use Case Diagram

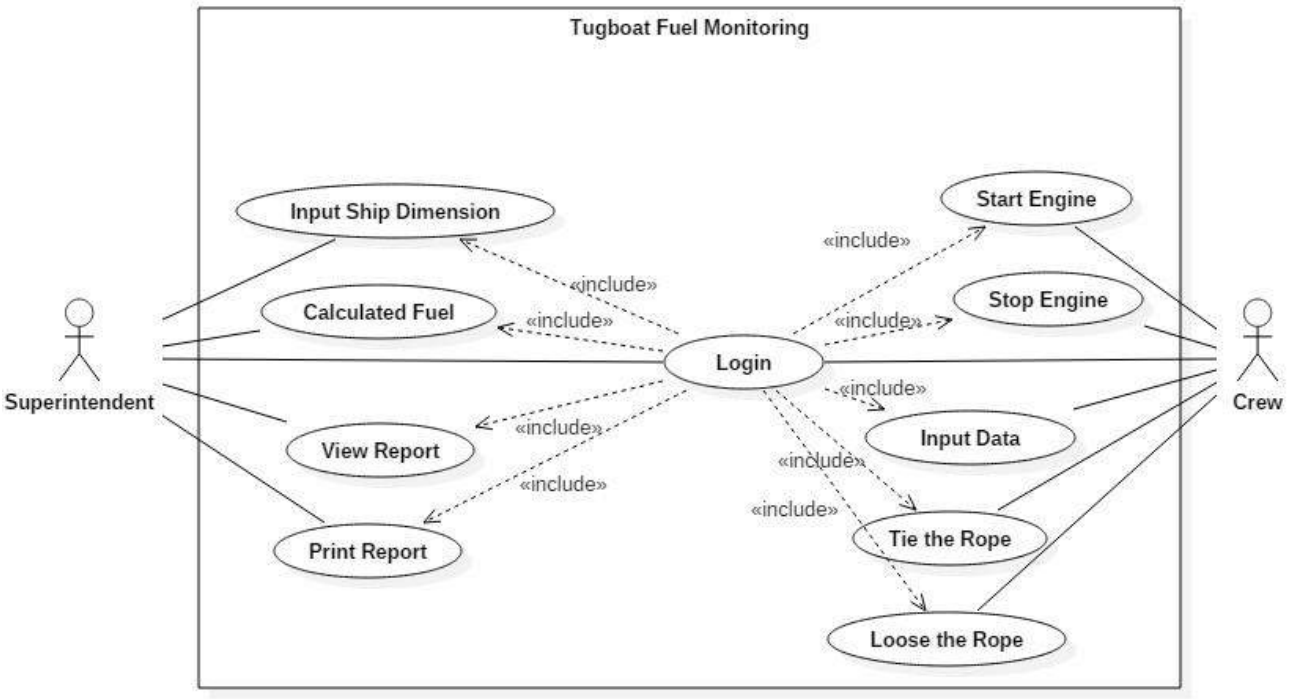

Figure 3. Use Case Diagram

The Use Case diagram of Figure 3 shows that the different roles each actor will have will be differentiated after the user logs on the system.

2.6 List and Description Use Case

2.6.1 Description Use Case "Login"

Table 1. Description Use Case "Login"

Use Case Narrative	**"Login"**
Aim	Users can access Tugboat Daily Report website
Description	The system provides a login function to the user in order to access the functionality of the Tugboat Daily Report website
Actor	Superintendent and Crew

Pre-condition	The user has not signed in on the Tugboat Daily Report website
Normal Flow	
User	**Sistem**
❑ User opens Tugboat Daily Report website	
	❑ Displays the main page showing maps and navigation menu login
❑ The user selects a login menu navigation	
	❑ Displays the user login page
❑ Users fill in username and password data	
❑ The user clicks the login button	
	❑ Conduct user verification based on username and password data
❑ User successfully logged in	
	❑ Displays the main page
Alternative Flow	
-	-
Exception Flow	
The entered username has not been registered in the system	
	Notify username is not yet registered
Incorrect password entered	
	Notify that the password entered is incorrect

Proses **login** diulang	
Post-condition: The user successfully logged in	
Assumption: The user is registered and will login	

2.6.2 Description Use Case "Input Ship Dimension"

Table 2. Description Use Case "Input Ship Dimension"

Use Case Narrative	**"Input Ship Dimension"**
Aim	Users enter data ship dimension of each vessel which has been run by the "crew"
Description	The system provides a function for charging the data ship dimension for the user, this data is used for input from the next use case.
Actor	Superintendent
Pre-condition	User has not filled ship dimension data
Normal Flow	
User	**Sistem**
❑ User opens Tugboat Daily Report website	
	❑ Displays the main page of Tugboat Daily Report website
❑ The user selects a login menu navigation and login	
	❑ Displaying the maps page along with the navigation menu for users "superintendent"
❑ User chooses navigation menu of data input	

	❑ Display the data input
❑ User fills in LOA, LBP, B, CB, Vcurrent, Vwind, Hwave data based on selected ship	
	❑ Storing ship dimension data from ships that have been loaded
Alternative Flow	
-	-
Exception Flow	
Incorrect data type input	
	Notify that the data type is loaded incorrectly
The process was repeated data entry	
Post-condition: Users successfully fill out the data ship dimension based on a particular ship	
Assumption: Ship Dimension for a particular ship on a given day has not been loaded	

2.6.3 Description Use Case "Calculated Fuel"

Table 3. Description Use Case "Calculated Fuel"

Use Case Narrative	**"Calculated Fuel"**
Aim	Users can determine the fuel needs of a tugboat in one day
Description	The system provides a fuel calculation function derived from inputting some data from users, both crew and superintendent

Actor	Superintendent
Pre-condition	Users do not know how much fuel is needed by tugboat
Normal Flow	
User	**Sistem**
❑ User opens Tugboat Daily Report website	
	❑ Displays the main page of Tugboat Daily Report website
❑ User chooses navigation report	
	❑ Displays a report page containing detailed ships that have been towed or driven by tugboats
	❑ Displays Estimated Fuel Used from a specific tugboat
Alternative Flow	
Users choose the navigation menu Fuel Estimated Report	
	Displays report tables from some tugboats for a given day
Exception Flow	
-	-
Post-condition: Users managed to find out the estimated fuel from tugboat for a given day	
Assumption: Data for fuel calculations have been entered	

2.6.4 Description Use Case "View Report"

Table 4. Description Use Case "View Report"

Use Case Narrative	**"View Report"**
Aim	Users can view reports both the Daily Operational Report and the Fuel Estimated Report
Description	The system provides a function to view reports from every tugboat on a daily basis, from Location, Operating Time, Service Time, Bollard Pull, Engine Load, Fuel Consumption, and more.
Actor	Superintendent
Pre-condition	Users do not know the report from Tugboat Daily Report website either Daily Operational Report or Fuel Estimated Report
Normal Flow	
User	**Sistem**
❑ User opens Tugboat Daily Report website	
	❑ Displays the main page of Tugboat Daily Report website
❑ User chooses navigation menu report	
	❑ Displays a report page containing detailed ships that have been towed or driven by tugboats
	❑ Displays the Daily Report page
❑ The user selects the Daily Operational Report report	
	❑ Displays the Daily Operational Report page

❑ The user selects the Fuel Estimated Report report	
	❑ Displays the Fuel Estimated Report page
Alternative Flow	
The user selects a menu navigation report	
	Showing daily report in the form of per day and can choose want to display a particular tugboat
Exception Flow	
User has not filled in the data	
	The report page will be empty
Post-condition: User managed to find out the report you want to see both the Daily Operational Report and Estimated Fuel Report	
Assumption: The data in the report to be displayed in the report page has been loaded	

2.6.5 Description Use Case "Print Report"

Table 5. Description Use Case "Print Report"

Use Case Narrative	**"Print Report"**
Aim	Users can print reports both Daily Operational Report and Fuel Estimated Report
Description	The system provides a function to dictate reports in the form of multiple formats ie webpage, plain HTML, Microsoft Excel Spreadsheet
Actor	Superintendent

Pre-condition	Users want to print a report on the Tugboat Daily Report website
Normal Flow	
User	**Sistem**
❑ User opens Tugboat Daily Report website	
	❑ Displays the main page of Tugboat Daily Report website
❑ User chooses navigation menu report then print menu	
	❑ Displays printed pages
❑ User selects data to be printed, whether All Report, Daily Operational Report, or Fuel Estimated Report	
❑ The user selects the report format you want to print, whether webpage, plain HTML, or Microsoft Excel Spreadsheet	
❑ The user clicks the print button	
	❑ Connecting with the printer
Alternative Flow	
-	-
Exception Flow	
Users have problems with the printer	
	Failed to print
Post-condition: User successfully printed report	
Assumption: Print the report successfully	

2.6.6 Description Use Case "Start Engine"

Table 6. Description Use Case "Start Engine"

Use Case Narrative	**"Start Engine"**
Aim	Users can start ship engine work
Description	The system provides a function to start the ship's engine operational work
Actor	Crew
Pre-condition	Users want to start ship engine work
Normal Flow	
User	**Sistem**
❑ User opens Tugboat Daily Report website	
	❑ Displays the main page of Tugboat Daily Report website
❑ User chooses navigation menu system	
	❑ Displays a pop up caution that contains approval for users when it wants to start shipboard engine operations
❑ User selects YES button	
	❑ Displays a page containing the Engine Start button
❑ The user clicks the Engine Start button	
	❑ Recording the start time of the system
Alternative Flow	
-	-
Exception Flow	

The user selects the NO button when a pop up caution is displayed which contains approval for the user when he / she wants to start the ship's engine operation	
	Kembali ke halaman awal
Post-condition: Users successfully start the ship's engine operations	
Assumption: Recording of operating time of new ship engine operation will commence	

2.6.7 Description Use Case "Input Data"

Table 7. Description Use Case "Input Data"

Use Case Narrative	**"Input Data"**
Aim	Users want to enter detailed data related to the ship being operational
Description	The system provides a function to enter data related to the name of the ship, laden ship, the location of the departure push or pull the ship to the destination location, and the date to be directly taken from the system in accordance with the date of the day
Actor	Crew
Pre-condition	User has not filled data
Normal Flow	
User	**Sistem**
❑ User opens Tugboat Daily Report website	
	❑ Displays the main page of Tugboat Daily Report website

❑ User chooses navigation menu system	
	❑ Displays a pop up caution that contains approval for users when it wants to start shipboard engine operations
❑ User selects YES button	
	❑ Displays a page containing the Engine Start button
❑ The user clicks the Engine Start button	
	❑ Displays the Data Input page
❑ The user fills in the data related to the name of the ship, full of ships, the location of departure when pushing or pulling the ship to the destination location.	
Alternative Flow	
-	-
Exception Flow	
Incorrect data type input	
	Notify that the data type is loaded incorrectly
The process was repeated data entry	
Post-condition: Users successfully fill in the data	
Assumption: The data is not filled	

2.6.8 Description Use Case "Tie the Rope"

Table 8. Description Use Case "Tie the Rope"

Use Case Narrative	**"Tie the Rope"**
Aim	Users can start tying the ship to be towed or driven
Description	The system provides a function to perform commands belt strap that will be recorded by the system
Actor	Crew
Pre-condition	Users want to perform fastening strap on the ship to be towed or driven
Normal Flow	
User	**Sistem**
❑ User opens Tugboat Daily Report website	
	❑ Displays the main page of Tugboat Daily Report website
❑ User chooses navigation menu system	
	❑ Displays a pop up caution that contains approval for users when it wants to start shipboard engine operations
❑ User selects YES button	
	❑ Displays a page containing the Engine Start button
❑ The user clicks the Engine Start button	
	❑ Displays the Data Input page
❑ User performs data filling	

❑ The user clicks the string button	
	❑ Record the starting time to do tie ropes to the vessel to be towed or driven
Alternative Flow	
-	-
Exception Flow	
-	-
Post-condition: Users successfully started doing rope belt on the ship to be towed or driven	
Assumption: The vessels will be pulled or pushed untied	

2.6.9 Description Use Case "Loose the Rope"

Table 9. Description Use Case "Loose the Rope"

Use Case Narrative	**"Loose the Rope"**
Aim	Users can start removing ropes that have been towed or driven
Description	The system provides a function to execute the loose rope command to be logged by the system
Actor	Crew
Pre-condition	Users want to do a loose rope on the ship that has been pulled or pushed
Normal Flow	
User	**Sistem**
❑ User opens Tugboat Daily Report website	

	❑ Displays the main page of Tugboat Daily Report website
❑ User chooses navigation menu system	
	❑ Displays a pop up caution that contains approval for users when it wants to start shipboard engine operations
❑ User selects YES button	
	❑ Displays a page containing the Engine Start button
❑ The user clicks the Engine Start button	
	❑ Displays the Data Input page
❑ User performs data filling	
❑ The user clicks the rope release button	
	❑ Recording time pulling or pushing ship has finished
Alternative Flow	
-	-
Exception Flow	
-	-
Post-condition: Users successfully complete the task to pull or push the ship at a time	
Assumption: The vessel has been completed is pulled or pushed	

2.6.10 Description Use Case "Stop Engine"

Table 10. Description Use Case "Stop Engine"

Use Case Narrative	**"Stop Engine"**
Aim	Users can stop the ship's engine work time recording
Description	The system provides a function to stop the operational work of ship engines
Actor	Crew
Pre-condition	Users want to stop the ship's engine
Normal Flow	
User	**Sistem**
❑ User opens Tugboat Daily Report website	
	❑ Displays the main page of the Tugboat Daily Report website
❑ The user selects a menu navigation system	
❑ The user selects the YES button	
❑ The user clicks the Engine Start button	
❑ Users fill in the data associated with the name of the vessel, laden ship, departure location when pushing or pulling the boat toward the destination location.	
❑ The user clicks “tie” button	
❑ The user clicks “loose” *button*	
❑ The user clicks next button	

	❑ Displays the page that contains the Next button and Engine Stop Operation
❑ The user selects the Engine Stop button	
	❑ Stopping recording of ship's engine operating performance
Alternative Flow	
-	-
Exception Flow	
-	-
Post-condition: The user successfully stopped the ship's engine operation	
Assumption: Operational work time recording new ship engines will be stopped	

CHAPTER III DATA DESIGNS

3.1 Data Decomposition

Table 11. Entity Description "user"

pengguna	*PRIMARY KEY* {id_pengguna}						
Data Member Name	**Description**	**Type**	**Additional Type Information**	**Default Value**	**Mandatory**	**Unique**	**NOTE**
id_pengguna	the user id of the Tugboat Daily Report system	integer	max 11	not null	YES	YES	The default value of application
nama_lengkap	the full name of the user	character varying	max 255	not null	YES	NO	
role	the role of the user whether the crew or superintendent	enum	'crew','operator'	not null	YES	NO	
username	username of the user account	character varying	max 100	not null	YES	NO	
password	password from user account	character varying	max 100	not null	YES	NO	unitm

Table 12. Entity Description "bollardpullrequired"

bollardpullrequired	*PRIMARY KEY* {Ship_name}						
Data Member Name	**Description**	**Type**	**Additional Type Information**	**Default Value**	**Mandatory**	**Unique**	**NOTE**
Date	Data entry date tugboat	date	DD:MM:YYYY	not null	YES	NO	The default value of application
Number	number indicating the order of the ship	integer	max 11	not null	YES	NO	

Ship_name	name of the ship	character varying	max 50	not null	YES	YES	
Type	type of ship	character varying	max 10	not null	YES	NO	
LOA	overall vessel length	double precision	angka	null	YES	NO	unit m
LBP	vessel length measured from the bow of a ship on the high-water line to the wheel	double precision	angka	null	YES	NO	unit m
B	width of the ship	double precision	angka	null	YES	NO	unit m
T	the vertical distance between the water line to the vessel area	double precision	angka	null	YES	NO	unit m
AL	the extent of the vessel exposed to the wind	double precision	angka	null	YES	NO	unit m^2
Vwind	wind velocity	double precision	angka	null	YES	NO	unit m/s
Fwind	the force on the ship due to the wind speed of the unit m / s	double precision	angka	null	YES	NO	unit ton
Vcurrent	tidal current speed	double precision	angka	null	YES	NO	unit m/s
FC	the force on the ship due to the unit current velocity m / s	double precision	angka	null	YES	NO	unit ton
Hwave	wave height	double precision	angka	null	YES	NO	unit m
Fwave	the force on the ship due to the unit current velocity m / s	double precision	angka	null	YES	NO	unit ton

Cb	coefficient of ship shape	double precision	angka	null	YES	NO	
Fmoor	Force that reacts when the ship gets docked	double precision	angka	null	YES	NO	unit ton
Bollard_pull	force capacity that can be withdrawn by tugboat	double precision	angka	null	YES	NO	unit ton
Tug	tugs that are operating simultaneously	double precision	angka	null	YES	NO	
Bollard_pull_required	tensile force needed	double precision	angka	null	YES	NO	unit ton
Engine_load_total	overall machine load	double precision	angka	null	YES	NO	unit %

Table 13. Entity Description "focrate"

focrate	*FOREIGN KEY* {Ship_name}						
Data Member Name	**Description**	**Type**	**Additional Type Information**	**Default Value**	**Mandatory**	**Unique**	**NOTE**
Ship_name	name of the ship	character varying	max 50	not null	YES	YES	
Loitering(come)_SB	a condition in which a tugboat approached when that will be pushed or pulled that affect the right engine	double precision	angka	null	YES	NO	unit kg/h
Loitering(come)_PS	a condition in which the tugboat approaches when it will be pushed or pulled which affects the left side of the machine	double precision	angka	null	YES	NO	unit kg/h

Waiting_SB_rate	a condition where a tugboat had reached the ship to be pushed or pulled that affect the right engine	double precision	angka	null	YES	NO	unit kg/h
Waiting_PS_rate	a condition where a tugboat had reached the ship to be pushed or pulled influential on the left engine	double precision	angka	null	YES	NO	unit kg/h
Low_assist_SB_rate	a condition in which a tugboat pushing or pulling a boat with a capacity of ½ bollard pull which affects the right engine	double precision	angka	null	YES	NO	unit kg/h
Low_assist_PS_rate	a condition in which a tugboat pushing or pulling a boat with a capacity of ½ bollard pull which affects the left engine	double precision	angka	null	YES	NO	unit kg/h
High_assist_SB_rate	condition where tugboat push / pull ship with ½ bollard pull capacity effect on the right machine	double precision	angka	null	YES	NO	unit kg/h

High_assist_PS_rate	a condition in which a tugboat pushing / pulling a boat with a capacity of ½ bollard pull which affects the left engine	double precision	angka	null	YES	NO	unit kg/h

Table 14. Entity Description "location "

location	*FOREIGN KEY* {Ship_name}						
Data Member Name	**Description**	**Type**	**Additional Type Information**	**Default Value**	**Mandatory**	**Unique**	**NOTE**
Ship_name	name of the ship	character varying	max 50	not null	YES	YES	
Location_from	starting place tugboat pushing or pulling ship	character varying	max 50	not null	YES	NO	filled by crew
Location_to	destination tugboat	character varying	max 50	not null	YES	NO	filled by crew
OP_time_start	tugboat time starts to operate	time	HH:MM:SS	null	YES	NO	
OP_time_end	a tugboat completed operations	time	HH:MM:SS	null	YES	NO	
Service_time_start	time tugboat start pulling or pushing the ship	time	HH:MM:SS	null	YES	NO	filled by crew
Service_time_end	time tugboat finish pulling or pushing ship	time	HH:MM:SS	null	YES	NO	filled by crew
Transit	duration of loitering time	integer	max 11	not null	YES	NO	
Service	duration of service time	integer	max 11	not null	YES	NO	

Total(minutes)	the total time required to pull or push the boat	integer	max 11	not null	YES	NO	

Table 15. Entity Description "foc"

foc	*FOREIGN KEY* {Ship_name}						
Data Member Name	**Description**	**Type**	**Additional Type Information**	**Default Value**	**Mandatory**	**Unique**	**NOTE**
Ship_name	name of the ship	character varying	max 50	not null	YES	YES	
Loitering_SB	a condition in which a tugboat approached when that will be pushed or pulled that affect the right engine	double precision	angka	null	YES	NO	Unit kg
Loitering_PS	a condition in which the tugboat approaches when it will be pushed or pulled which affects the left side of the machine	double precision	angka	null	YES	NO	Unit kg
Waiting_SB	a condition where a tugboat had reached the ship to be pushed or pulled that affect the right engine	double precision	angka	null	YES	NO	Unit kg
Waiting_PS	a condition where a tugboat had reached the ship to be pushed or	double precision	angka	null	YES	NO	Unit kg

	pulled influential on the left engine						
Low_assist_SB	a condition in which a tugboat pushing or pulling a boat with a capacity of ½ bollard pull which affects the right engine	double precision	angka	null	YES	NO	Unit kg
Low_assist_PS	a condition in which a tugboat pushing or pulling a boat with a capacity of ½ bollard pull which affects the left engine	double precision	angka	null	YES	NO	Unit kg
High_assist_SB	condition where tugboat push / pull ship with ½ bollard pull capacity effect on the right machine	double precision	angka	null	YES	NO	Unit kg
High_assist_PS	a condition in which a tugboat pushing / pulling a boat with a capacity of ½ bollard pull which affects the left engine	double precision	angka	null	YES	NO	Unit kg
Total(kg)	total of loitering, waiting, low assist, and high assist	double precision	angka	null	YES	NO	Unit kg

Total(L)	total of loitering, waiting, low assist, and high assist divided by constants	double precision	angka	null	YES	NO	Unit L

Table 16. Deskripsi Entitas "focgenerator"

focgenerator	*FOREIGN KEY* {Ship_name}						
Data Member Name	**Description**	**Type**	**Additional Type Information**	**Default Value**	**Mandatory**	**Unique**	**NOTE**
Ship_name	name of the ship	character varying	max 50	not null	YES	YES	
Quay_AE_1	when tugboat rests on the harbor	double precision	angka	null	YES	NO	
Quay_AE_2	when tugboat rests on the harbor	double precision	angka	null	YES	NO	
Service_AE_1	duration of service time	double precision	angka	null	YES	NO	
Service_AE_2	duration of service time	double precision	angka	null	YES	NO	
Total_foc	total from quay and service foc generator	double precision	angka	null	YES	NO	satuan kg

3.2 ERD (Entitas Relationship Diagram)

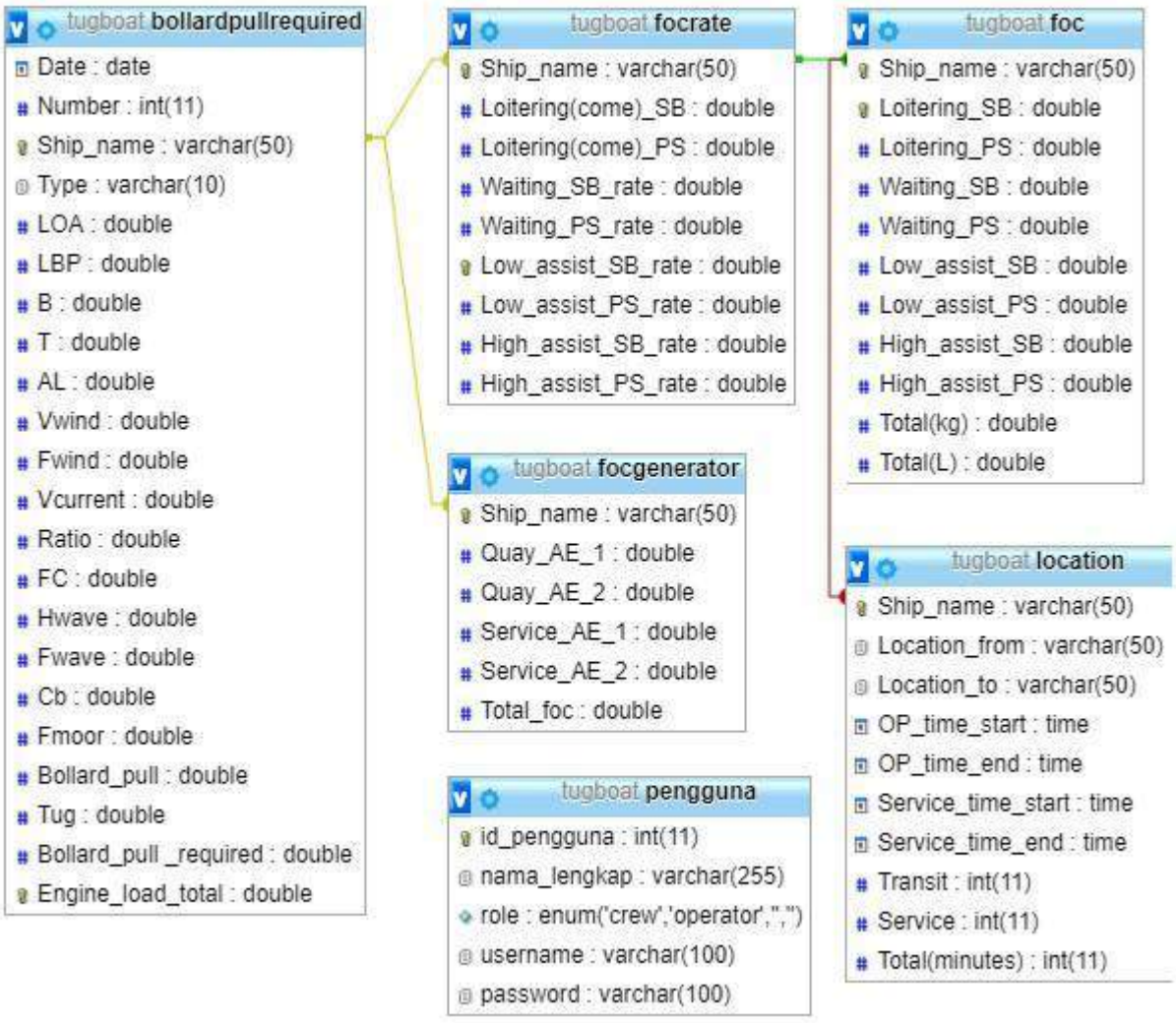

Figure 4. Entity Relationship Diagram Tugboat Daily Report

Figure 4 is an Entity Relationship Diagram of the database in Tugboat Daily Report website creation.

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CHAPTER IV DESIGN OF INTERFACE

4.1 User Interface

Tugboat Daily Report uses a website-based interface that can be operated through website access. This Information System is operated by 2 user / user, that is crew and superintendent tugboat. Crew has access to be able to monitor the ship's engine operation (operation and service time), as well as carrying out a full load of ships. While superintendent have access to filling based on data that has been entered by crew that is ship dimension and see report.

User Crew Interface :

4.1.1 Login Interface

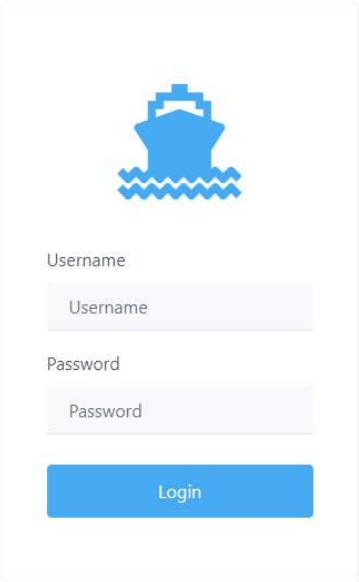


Figure 5. Tugboat Daily Report's website login page

This interface is a display of login page Tugboat Daily Report website users. The user must input the username and password correctly in the field provided. When the login button is pressed, the system checks the username and password entered with the username and password stored in the database. If the username and password data is correct or suitable then the user will enter into the system, on the contrary if the username and password is wrong or not match it will be given a warning message.

4.1.2 Engine Start Interface

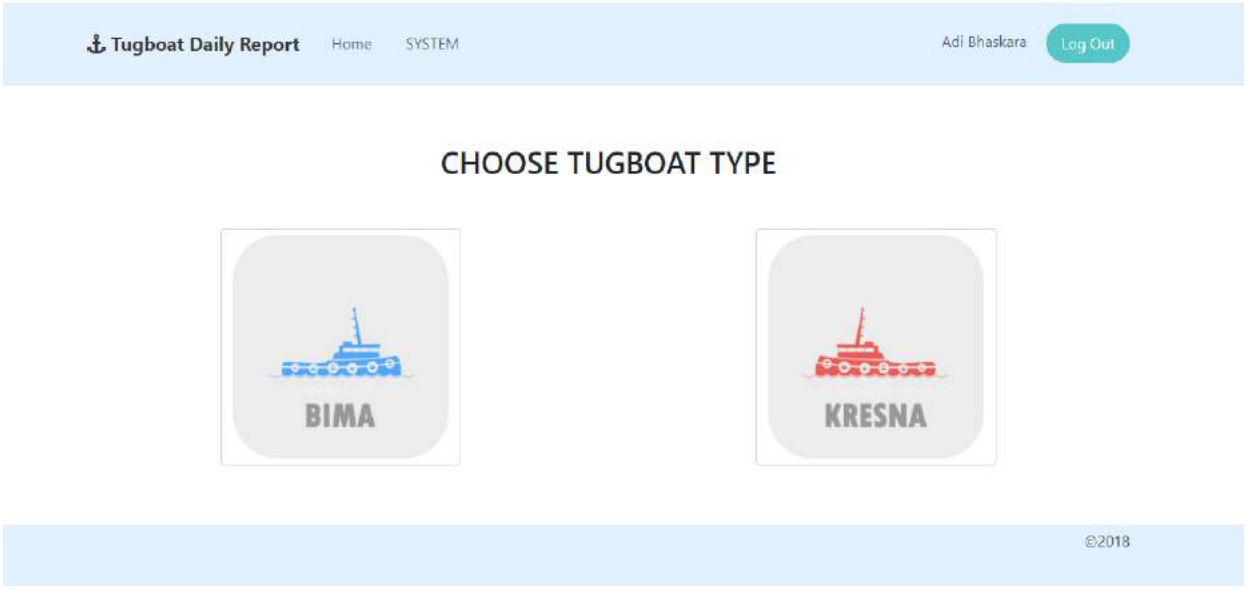


Figure 6. Tugboat Selection

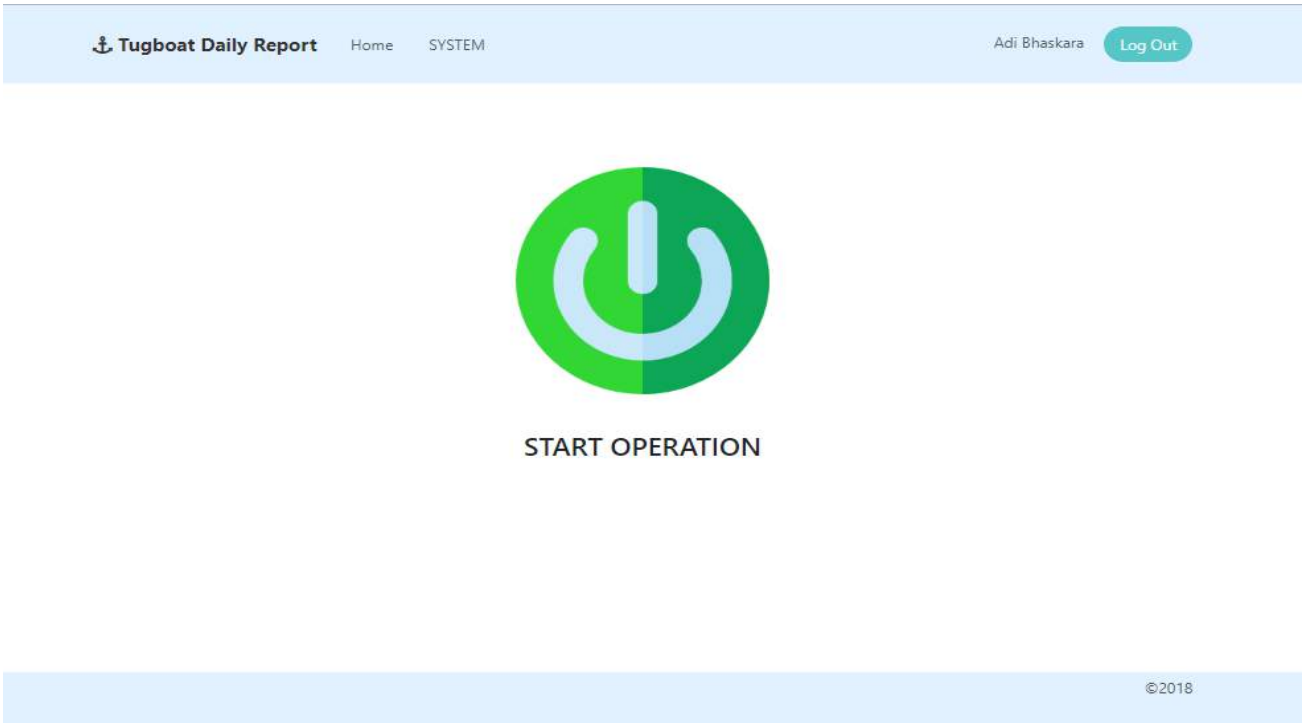


Figure 7. Engine Start Page

This interface is a page to start the ship engine work, recording that indicates the machine works can be done by clicking the "Engine Start" button. The system will automatically record the start time of ship engine operation shown by HH: MM: SS.

4.1.3 Input Data System Interface

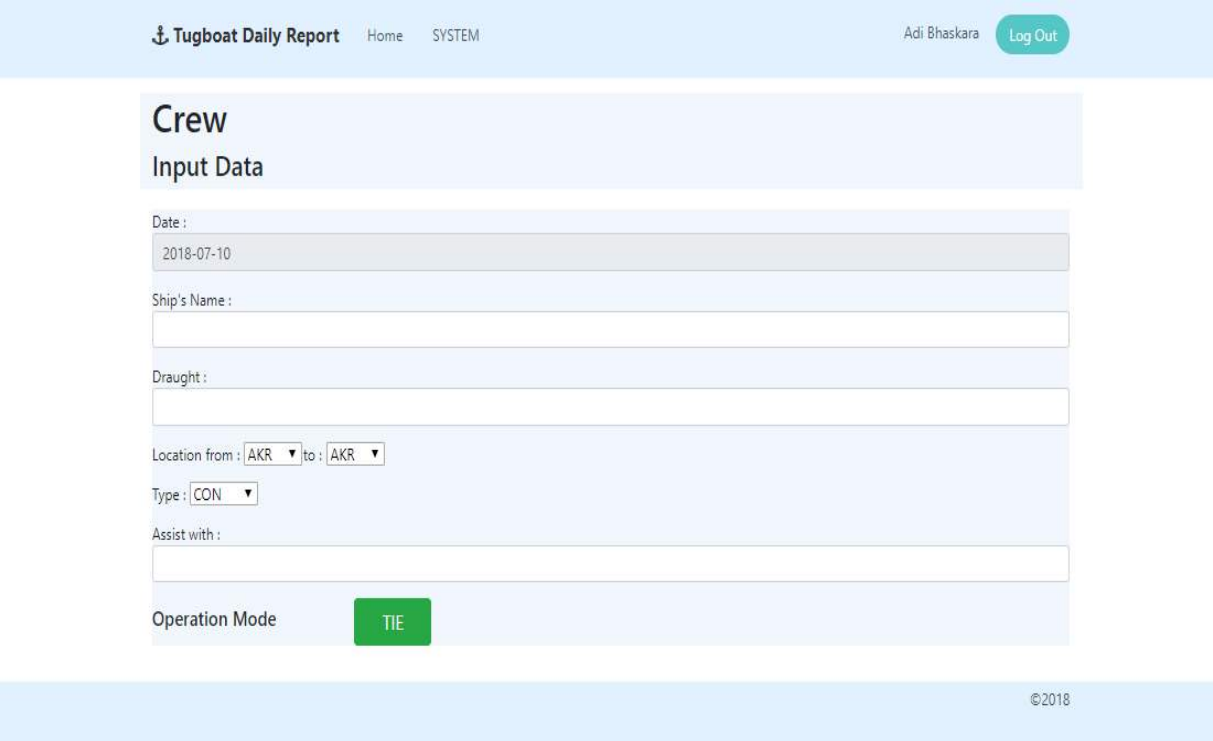


Figure 8. input data user page

This interface is the page to enter the data required by the user crew. The date on this page will automatically take time on the system, and the location that is loaded is based on the origin and destination maps. And there is a button "Tie Rope" to notify the system that will start to perform the operation of the ship and the "Release Rope" button to notify the system that ship operations have been completed and reach the intended location.

4.1.4 Engine Stop Interface

Figure 9. Engine Stop Page

This interface is an overview of "Engine Stop" and "Next Operation" from the Tugboat Daily Report website. When the crew user has finished performing the operation and has returned to the initial location (parker tugboat), the crew user can press the "Engine Stop" button, while if tugboat will do the next operation to push another ship, the crew user can press "Next Operation" button.

4.1.5 Logout Crew Interface

Figure 10. logout system crew page

This interface is a page to perform system logout on user crew.

User Super Intendent Interace:

4.1.6 Login Interface

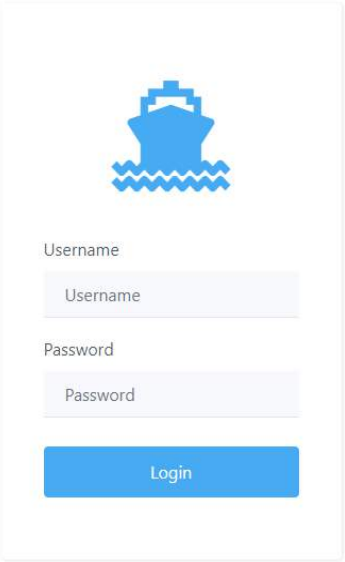
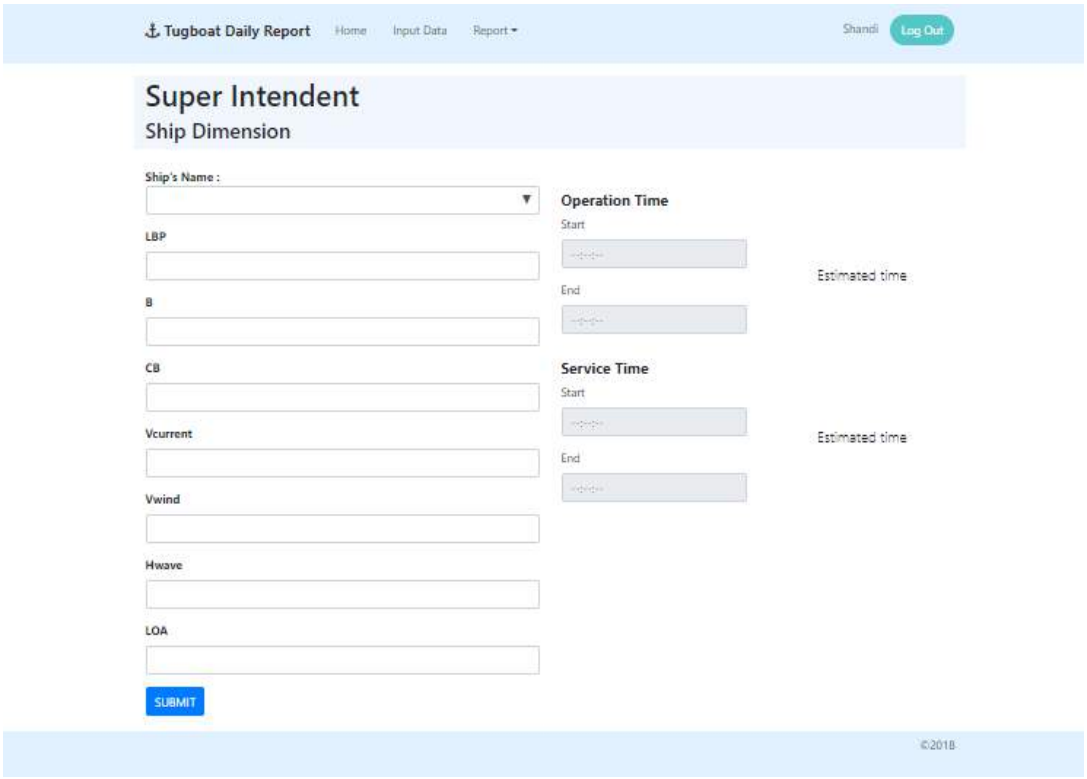


Figure 11. User login page

This interface is a display of login page Tugboat Daily Report website users. The user must input the username and password correctly in the field provided. When the login button is pressed, the system checks the username and password

entered with the username and password stored in the database. If the username and password data is correct or suitable then the user will enter into the system, on the contrary if the username and password is wrong or not match it will be given a warning message.

4.1.7 Data Input Interface



Gambar 12. Halaman input data pengguna "superintendent"

This interface is a page for entering data for "superintendent" users. On this page the superintendent user will automatically be able to read the incoming ship data on a certain date with the operation and service time corresponding to each tugboat.

4.1.8 Report Selection Interfaces

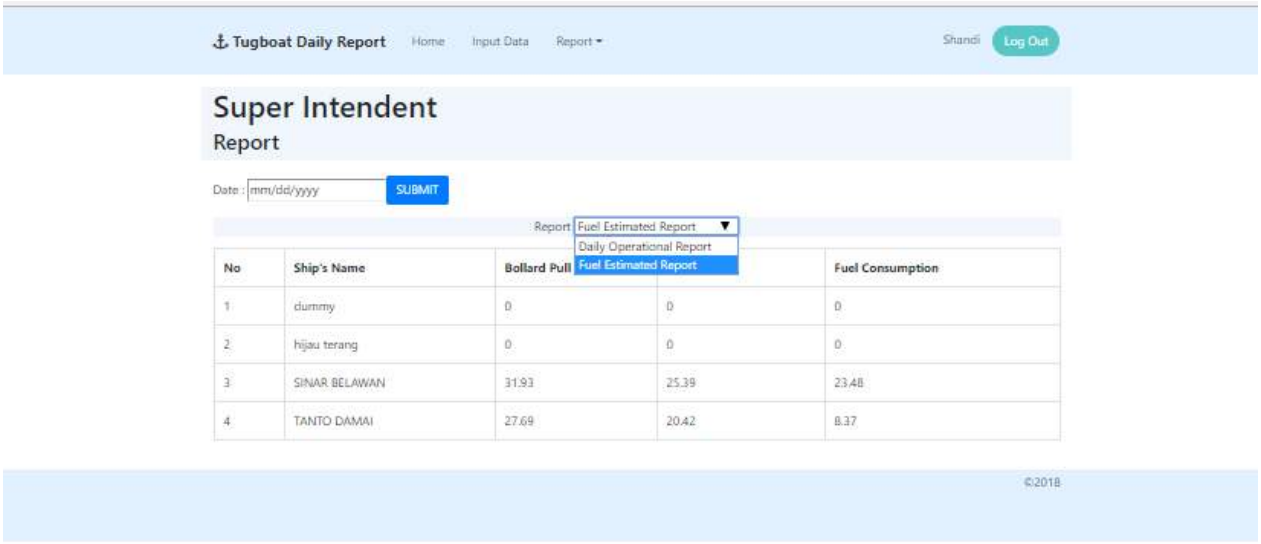


Figure 13. The report selection page that you want to see and print

This interface is the reporting page of the report that superintendent users want to see the Daily Operational and Fuel Estimated Report. The default view of this page is the Fuel Estimated Report.

4.1.9 Daily Operational Report Interface

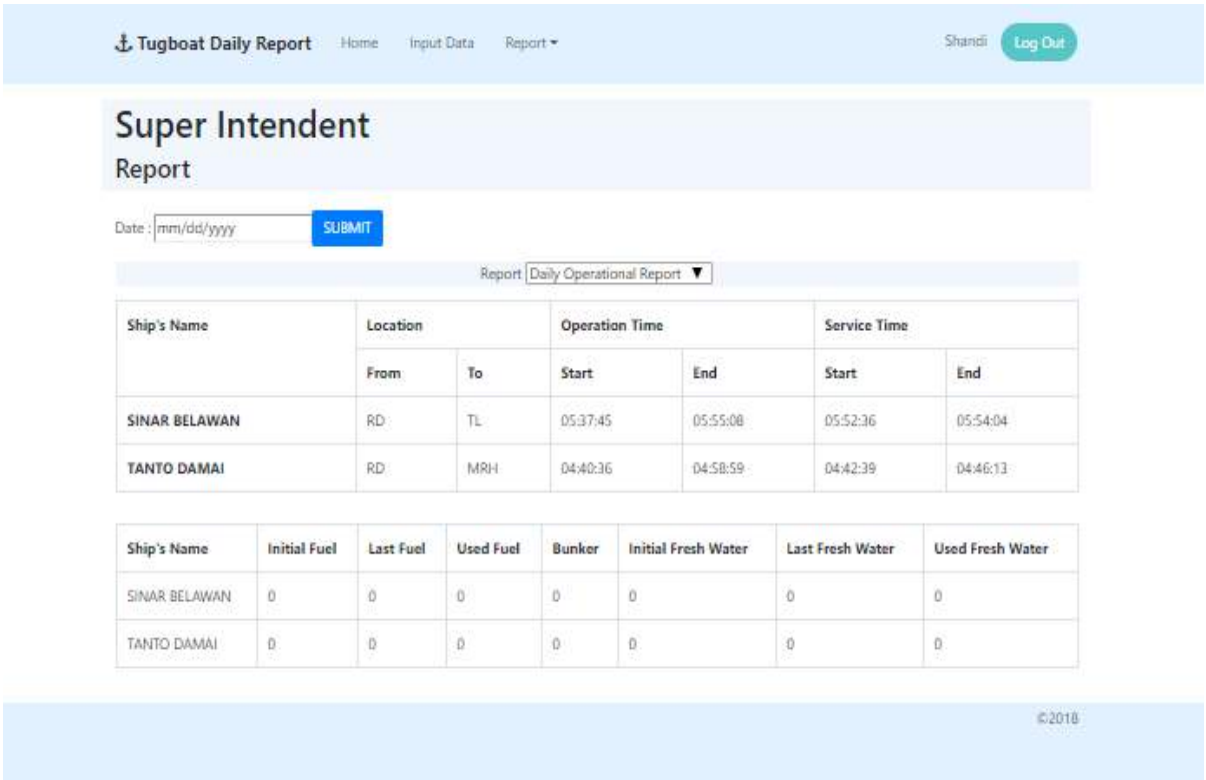
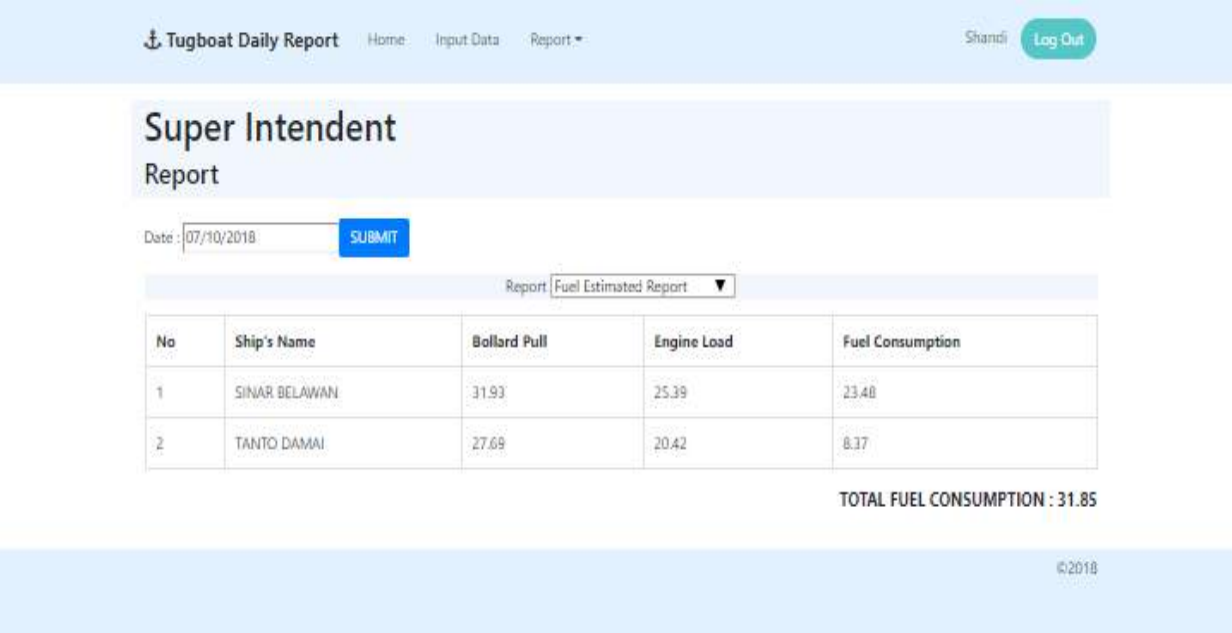


Figure 14. Page Daily Operational Report

This interface is a Daily Operational Report page view, the view of this page can be selected in accordance with the report on the selected day in Date. On this page superintendent users can print reports by clicking on the "Print" button which will then go to the print page.

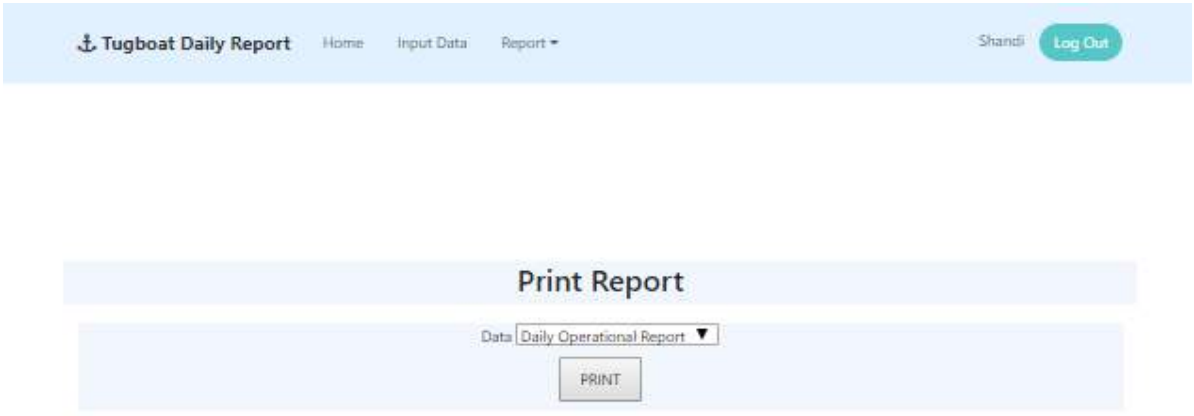
4.1.10 Fuel Estimated Report Interface



Gambar 15. Halaman Fuel Estimated Report

This interface is a Fuel Estimated Report page view, the view of this page can be selected in accordance with the report on the selected day in Date. On this page superintendent users can print reports by clicking on the "Print" button which will then go to the print page.

4.1.11 Report Print Interface



Gambar 16. Halaman print report

This interface is a page view for printing reports with a specific format, ie webpage, plain HTML, Microsoft excel spreadsheet. Then to print a report can be done by clicking the "Print" button.

4.1.12 Logout Superintendent Interface

Figure 17. Superintendent system logout page

This interface is a page to perform system logout on user crew.

4.2 Hardware Interface

The minimum hardware requirements that can be used for Tugboat Daily Report software development are:Mac OSX 10.6.8 or newer

- Windows Vista, 7, or 8/8.1 (x32 and x64) (installer requires administrator access)
- Linux Ubuntu 12.04 or newer (x32 and x64)
- Debian Linux 8 or newer (for Debian 7 compatibility see issue #4816)
- RAM 2 GB

4.3 Software Interface

The minimum requirement of software that can be used for Tugboat Daily Report software development is

- *Database* mySQL
- *Web server* apache

4.4 Communication Interface

The minimum communication requirements that can be used for Tugboat Daily Report software development are:

- *Https rsa2048*
- *Encrypt* password md5
- *Hashing API* bcrypt
- *Server* debian
- *Transmission Control Protocol/Internet Protocol* (TCP/IP)

AUTHOR'S BIOGRAPHY

AUTHOR BIOGRAPHY

Panji Kresno W, born on May 13rd 1996 in Surabaya, East Java. The first family of the six siblings from a couple Mr. Bambang Sri M and Mrs. Farida Ariyanti. Author finished several formal education started from SDN Dupak 5 Surabaya, SMP Kawung 1 Surabaya, and SMAN 21 Surabaya, after graduated from high school in SMAN 21 Surabaya, author continued his study in Double Degree Program, Department of Marine Engineering, Faculty of Marine Technology, Institut Teknologi Sepuluh Nopember (ITS) with Hochscule Wismar. During his study at the university, the author actively participating in social activities such as ITS Mengajar For Indonesia 2015 as a teacher in probolinggo, FTK Mengajar 2016 as a head of FTK Mengajar Program in Surabaya, ITS Mengajar for Indonesia 2016 as a head of ITS Mengajar for Indonesia 2016 in Tuban and ITS Mengajar for Indonesia 2017 as a program supervisor. The author also actively organizes the vice chairman of ITS Education Care Center (IECC) – BEM ITS 16/17. The author takes the Marine Operational and Maintenance (MOM) as study of interest.

Phone/WA : 081252715712
Email : panjikresnow@gmail.com